

ONE WILD RIDE ON BOARD A SNOWPLOW p. 48

Trains

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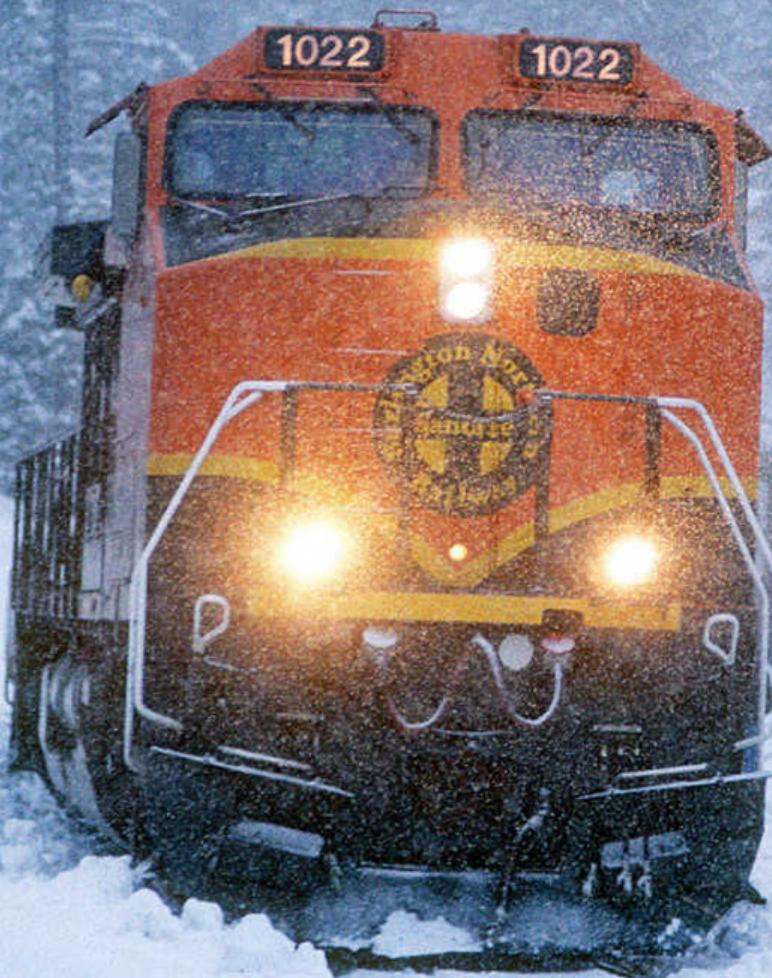
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Photo by Tom Gildersleeve



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JIM WRINN

Don't forget your origins

I was admiring a BNSF Railway coal train, dropping down grade near Hyannis, Neb., when I started thinking about the changing railroad leadership in North America. The top dogs of just about every major railroad, except this one, changed recently or are about to change.

Going or gone are the higher-ups who recall the bad old days of the 1970s when Penn Central was the largest bankruptcy in history, track was bad, much of the Northeast and Midwest was a mess, and rundown, money-losing passenger trains were just a part of daily life.

In their place is a new generation of trainmasters, superintendents, vice presidents, and CEOs who came along after the Staggers Act deregulated the industry, after Conrail brought order from chaos in the Northeast, and after Amtrak took on the thankless burden of toting tolerant Americans on a skeleton system.

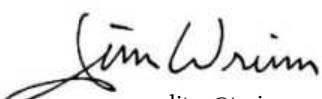
The new management takes the throttle under enormous pressure from investors to earn a buck and from market influences beyond its control that affect everything from the industry's historical traffic mainstay, coal, to its latest darling, oil.

Our hope for the next generation of railroad officials is that in this whirlwind of change, they keep an appreciation for this

unique industry. You are a corporation, but you are more than that. You are a special business, unlike any other. Value that, nurture that. Stay focused on the track ahead but glance in the rear-facing mirror and nod approvingly at what was before.

As the old guard heads out, we hope they'll remind those on the next watch to acknowledge and promote the industry's rich history as a way to reach communities, employees, customers, and, yes, even shareholders. If they do, they'll find they will instill pride, loyalty, and inspiration.

They'll also attract new passionate professionals who will continue to make the railroad business great, whether it is through service in a locomotive cab, in a shop, on a ballast regulator, in a dispatch center, or even in the executive suite.


editor@trainsmag.com



An eastbound BNSF Railway coal train drops down grade near Hyannis, Neb., in September 2015. Can railroading move forward while maintaining its unique place? **TRAINS:** Jim Wrinn

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A CSX SD70MAC/ES44 lash-up leads a southbound freight over the River Subdivision at Highland, N.Y., viewed from the Walkway Over the Hudson. Scott A. Hartley

HUDSON RIVER HOT SPOT

I enjoyed reading "George Hamlin's Top 10 Hot Spots" [pages 64-65, October] and would like to add the Walkway Over the Hudson to the Hudson River Valley, N.Y., location.

Constructed on top of the former New Haven Railroad's Poughkeepsie-Highland bridge, the Walkway Over the Hudson is one of the best train-watching sites in that area. More than 200 feet above the Hud-

son River, the bridge offers unobstructed views of the CSX Transportation line to the west and Amtrak and commuter railroad Metro-North to the east. Any railfan visiting the Hudson Valley needs to treat himself to this spot.
*Benjamin W. Manfull
East Haddam, Conn.*



RAILROADS HAVE TO EARN

I enjoyed the September issue with articles from old friends, Dan Machalaba ["Railroading's Biggest Blunders," pages 46-57] and Fred W. Frailey's column ["Railroads Face Life After Coal," pages 14-15]. However, I fear that something is rotten in the roundhouse. I detect an undercurrent of populist fantasy and misplaced anger aimed at Wall Street. To wit, Dan writes about a lack of spending and the removal of extra capacity without regard to "return on investment," while Fred writes that Wall Street only looks at the short term. So, the inference goes, the railroad problems today are the fault of Wall Street.

I often argue with the financial community for a longer term outlook for railroads, which have to try to balance imperfect demand planning with capital expenditures that involve 30-to-50-year asset lives. It's time to bury that old false canard that railroads would be great if only they weren't held to the standards of any other ongoing concern. Railroads are hardly under-investing. In fact, they have been spending close to 20 percent of their revenues for most of this decade, and they can continue to spend those large amounts if owners see that the returns are justified.

Anthony B. Hatch, New York

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Railroads say they'll have to stop all traffic, like this BNSF Railway LPG train near Littleton, Colo., without a PTC extension. Chip Sherman

Railroads at the edge of the abyss

More than 20 railroads tell Congress they'll shut down in January without a PTC deadline extension

Looking to avoid an unprecedented shutdown of the national rail network — and the gridlock and economic crisis that would follow — Congress in October was working on legislation to extend the deadline for implementation of positive train control. The issue took on urgency in September, when Class I railroads warned Congress and customers that they would have to refuse certain hazardous chemical shipments and suspend Amtrak and commuter service beginning New Year's Day if they were not given more time to install PTC.

BNSF Railway went a step further, threatening a near-total shutdown.

"BNSF has evaluated the competing statutory and regulatory requirements regarding operations on mandated lines where PTC has not been installed and operational as of Jan. 1, 2016, and our legal analysis calls into question whether we legally may operate any freight or passenger service on such lines," President and CEO Carl Ice wrote in a Sept. 9 letter to U.S.

Sen. John Thune, R-S.D., who had sought railroads' input. BNSF must install PTC on the half of its network that carries 80 percent of its traffic.

CSX Transportation and Union Pacific said they might be forced to shut down if the Federal Railroad Administration levies fines on all freight trains, not just those carrying toxic inhalation hazard chemicals. The FRA later said it would fine railroads for operating any traffic on non-compliant lines.

"Should the FRA take such a broad action, we will have to consider an embargo on virtually all rail freight that we handle on lines that are to be equipped with PTC despite its untold consequences for the U.S. economy," UP President and CEO Lance Fritz wrote.

Executives from CSX, Norfolk Southern, and UP said they would have to wind down chemical shipments well before the deadline and halt passenger service beginning Jan. 1. Their counterparts at Canadian National,

Canadian Pacific, and Kansas City Southern took a somewhat softer tone, but said they, too, were considering doing the same on lines in the U.S. And NS Chief Executive James Squires told Thune that his railroad might challenge the deadline in court.

The Association of American Railroads, shippers, rail labor, and commuter agencies supported the House bill filed on Sept. 30 that would push the PTC deadline to Dec. 31, 2018. The bill, which had wide bipartisan support, was expected to clear the House in October. It then would move to the Senate, where a similar provision passed easily this summer as part of larger legislation.

In laying out the worst-case scenario of



A PTC antenna.
David Lustig

PTC has come a long way ...

August 1985 - Burlington Northern executives approve testing a PTC prototype system, ARES, in Minnesota's Iron Range.

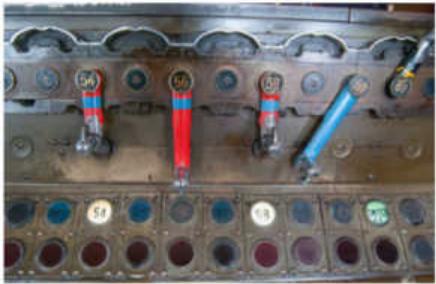
May 1, 2007 - U.S. Rep. James Oberstar introduces H.R. 2095 that will become the Rail Safety Improvement Act of 2008, requiring PTC implementation.

Sept. 12, 2008 - Metrolink commuter and Union Pacific freight trains collide, killing 25, in Southern California. The engineer at fault was texting and missed a stop signal.

October 2008 - Pres. George W. Bush signs Oberstar's bill into law. Deadline for U.S. railroads to comply set for Dec. 31, 2015.

January 2010 - Federal Railroad Administration issues first set of "final" PTC implementation rules. Railroads oppose regulatory language and definitions.

July 2010 - Association of American Railroads challenges FRA rules in court. Class I railroads work to obtain more radio frequencies.



With PTC, new technology must work flawlessly with the old, like these control levers from Metra's Tower A2 in Chicago.

TRAINS: Steve Sweeney

a crippled rail network and stranded commuters, the Class I executives made a legal argument: running trains beyond Jan. 1 without a deadline extension violates the law which likely cancels out railroads' common carrier obligations. Operating without the extension also opens up railroads to hefty FRA fines and additional legal liability in the case of an accident that a court later says PTC could have prevented. And the arguments may be sound.

"The common carrier obligation is not absolute, and railroads can lawfully suspend service for various reasons, including safety," Surface Transportation Board Chairman Daniel Elliott III wrote in a letter to Thune. However, nothing like the service embargo the railroads are proposing has ever come before the board, Elliott wrote, making shippers especially nervous.

"It's difficult, complex, and frightening for everyone at this point," Bruce Carlton, the president of the National Industrial Transportation League, the nation's oldest shipper group, told TRAINS in September.

Trade groups for chemical, chlorine, and fertilizer manufacturers warn that a service interruption would have significant economic and public health effects. Consequences include drinking water shortages in public systems that rely on rail-shipped chlorine; no PVC plastic for manufacturers of medical supplies, including IV bags; and higher food prices if fertilizer manufacturers couldn't receive anhydrous ammonia.

"There's an awful lot riding on Congress' action or inaction," the League's Carlton said. "The reach on this is huge."

— Bill Stephens

Senate committee focused on PTC during Feinberg hearing

Thune looking to Feinberg as a leader on a challenging issue

One of the senators asking Sarah Feinberg questions on Sept. 17 pointedly told the railroad regulator that she would be asked "boss questions."

U.S. Sen. Claire McCaskill, D-Mo., spoke tersely to Feinberg, who has served as acting administrator for the Federal Railroad Administration since January.

McCaskill said she was dissatisfied with recent FRA statements and with Feinberg's answers to senators' questions about what would happen if Congress fails to pass an extension to the Dec. 31, 2015, positive train control deadline.

"They have to make a tough decision and so do you," McCaskill said of railroads, and referred to railroad executives who say that they will have to halt operations if Congress fails to extend the PTC deadline. "What I'm trying to figure out is, we're going to have a huge mess. It's going to be dangerous and damaging to our economy. We know what the situation is going to be."

The questioning was part of Feinberg's confirmation hearing before the U.S. Senate's Committee on Commerce, Science, and Transportation that oversees the FRA, among other agencies. President Barack Obama appointed Feinberg to the post in January, following the departure of long-time FRA administrator Joseph Szabo, who stepped down last year.

Obama officially nominated Feinberg for the post in May.

Feinberg told McCaskill of the schedule of fines that FRA intends to impose on non-compliant railroads starting Jan. 1, saying they would be "significant."

"I think you need to be more specific than 'significant' fines," McCaskill said.

Feinberg later described to another senator that the maximum fine per occurrence, per day to a railroad is \$25,000, but that the severity of a fine depends on whether railroad violations are "willful."

McCaskill also tried to get Feinberg to say whether she supported the Government Accountability Office's recommendation that Congress give FRA authority to extend deadlines on a piecemeal basis for railroads. Feinberg declined to commit to the recommendation, but later said she

supported an earlier Obama administration proposal that would extend deadlines in much the same way.

Committee Chairman U.S. Sen. John Thune, R-S.D., opened the hearing by remarking briefly about Feinberg's extensive communications experience but lack of railroad experience, and then mostly discussed issues surrounding PTC. Thune later told Politico.com that he supports Feinberg's nomination and that he would try to fast-track her confirmation.

During the hearing, Feinberg said, "Yes" to a question asking if railroads would be violating the law if

the PTC deadline was not extended and they operated traffic other than toxic-by-inhalation hazard or passenger traffic.

Certain railroad observers argue that since PTC systems are required only on main lines that carry certain toxic cargoes or passengers, that simply dropping that traffic would waive the requirement. Feinberg's answer confirms it does not, at least from the point of view of FRA officials.

Other senators praised Feinberg in their comments and thanked her for stepping up to serve in a difficult time for the railroad industry. — Steve Sweeney



Senators are expected to confirm Sarah Feinberg, pictured, as FRA chief, but still grilled her about PTC.

AP Photo/Cliff Owen

March 2011 - FRA and AAR reach settlement on differences.

May 2012 - FRA issues a second set of "final" PTC rules.

December 2012 - FRA issues a third set of proposed rules.

May 2013 - Federal Communications Commission tells AAR, FRA that rail-

roads must apply for historic review of every PTC radio tower.

May 2014 - Affected parties reach radio tower application agreements.

Aug. 7, 2015 - FRA releases a report saying railroads would not meet the PTC deadline and would fine railroads per violation for failing to meet it.

Sept. 9, 2015 - More than 20 railroads, beginning with BNSF Railway, tell the public and Congress they cannot operate after Jan. 1, 2016, if the deadline is not changed.

Sept. 30, 2015 - House Bill 3651 introduced to extend the PTC deadline to Dec. 31, 2018.

>> Amtrak's 'Vermonter' takes a spill



Amtrak's **Vermonter** struck a fallen rock in early October. Southbound train No. 55 derailed south of Northfield, Vt., on Oct. 5, injuring four passengers and three crew members. All were released from the hospital by the next day. All five cars derailed, and the locomotive and lead car went down an embankment. Cleanup took several days due to the remote location. **Kevin Burkholder**

GE Capital sells railcar businesses

Union Tank Car parent, Wells Fargo to acquire assets

As part of GE's larger plan to reconstruct its businesses, the conglomerate's GE Capital division will sell off all freight car leasing and repair businesses.

All tank cars and tank car-related business went to Berkshire Hathaway-owned The Marmon Group as of Oct. 1. Marmon is the parent company for Union Tank Car Co. in Chicago.

GE says the sale of all other freight car leasing and repair business is pending regulatory approval, but could be sold to Wells Fargo & Co., a bank, by early 2016.

According to GE Capital's rail website, the company offers thousands of tank cars, covered hoppers, gondolas, boxcars, and flatcars to shippers and railroads throughout North America. The company has repair shops located in Pennsylvania, Iowa, Saskatchewan, Arkansas, and Nebraska.

— **Steve Sweeney**

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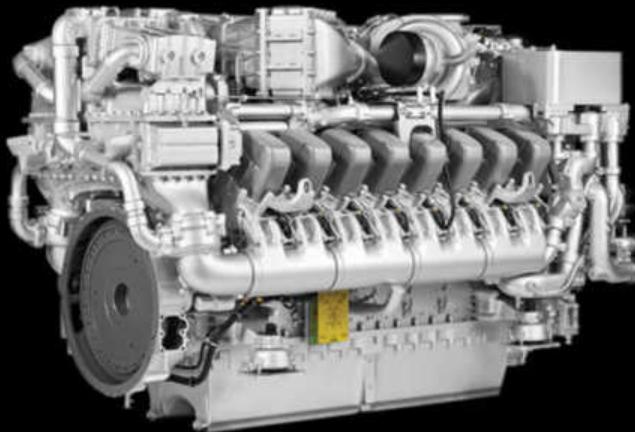
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Are we facing a shipping disaster?

Nobody wants it, but can Congress take action before it begins?

Seldom in my decades of covering railroads have I seen such a show. The entire industry, including all freight railroads and all major commuter railroads, has declared it will either shut down operations or stop hauling dangerous materials if Congress does not pass any extension of the Dec. 31 deadline for installing positive train control. Either industry action would be a disaster.

This may come as a surprise to most readers. I have been keeping up with the situation, and I knew what had been happening, but even I am shocked by the intensity of the campaign to persuade Congress to act soon. Part of my surprise is that Democrats and Republicans in both the House and the Senate overwhelmingly favor the extension. My railroad friends agree with me when I say there's far less than a 1 percent chance the bill would be defeated or be overlooked as Congress rushes to adjourn for the year. But that doesn't answer the question: Why are the railroads doing this?

The real reason is that Washington is a strange place where things often happen that make no sense. The purpose of this column is to explain what is really going on and why the railroads are seriously worried.

Let me introduce you to the most important person involved in this drama, Sen. John Thune, a Republican from South Dakota who is chairman of the Senate Committee on Commerce, Science, and Transportation. Some time back, Thune asked freight railroads and commuter railroads what would happen if Congress failed to pass legislation extending the deadline. The replies were unanimous in saying they would shut down most if not all operations. "We cannot wait until the last minute to act," Thune said at a hearing. Without congressional action, Thune said, railroads will probably "begin to cycle traffic off their lines" four to six weeks prior to Dec. 31. This would cause major economic disruptions, he said. The 2008 Rail Safety Improvement Act requires PTC and mandates that it be installed by this Dec. 31.

BNSF Railway was clear that it will offer no service on any line where PTC will be required, freight or commuter. All railroads said they would not run passenger trains, and Amtrak service must stop a few days early to be certain trains get to the end of the line before midnight Dec. 31. Railroads also said they would not haul any hazardous materials, and would embargo them weeks before the deadline. Many industries are upset by the idea of a hazmat embargo because hazmat includes materials overlooked by the public. For example, water purification would stop quickly. Some industries said the common carrier obligation would require the railroads to haul all freight, but that idea was shot down by the chairman of the Surface Transportation Board, Daniel Elliott, who said in a letter to the Senate commerce committee that the common carrier obligation "is not absolute, and railroads can suspend service for various reasons including safety."

The railroads were not the only organizations to predict disaster. For instance, the independent Government Accountability Office issued a report calling the end-of-year deadline impossible.

Almost everyone who reads this column understands PTC. But for those who do not, PTC is a system the railroads were ordered to install that would automatically stop trains if the engineer attempts to run a red signal or exceed speed limits.

Edward Hamberger, president of the Association of American

I AM SHOCKED BY THE
INTENSITY OF THE CAMPAIGN TO
PERSUADE CONGRESS TO ACT SOON.



A unit oil train heads west out of BNSF's Cicero (Ill.) yard in April 2015. Regulations requiring PTC on lines carrying passengers and hazardous materials have prompted BNSF and other railroads to say they may shut down service on those routes. TRAINS: David Lassen

Railroads, said the urgency of the situation means the industry must "raise the heat" so that Congress understands the necessity of early action.

The fear has been that nothing would be passed before railroads must begin the shutdown process. That would do serious damage to the railroads and their shippers. In fact, shippers have joined the campaign to lobby for early passage. That includes the National Industrial Transportation League, chemical shippers, and agriculture shippers. Ports would begin to clog up in December or earlier as railroads phase out stack train service. Oil trains would be sidelined.

Shortly before the final deadline for this column, the House Committee on Transportation and Infrastructure surprised everyone with a separate bill on PTC. The bill was sponsored by both Republicans and Democrats. Hamberger could hardly contain his enthusiasm.

"The committee leadership clearly recognizes the need for immediate action to forestall the looming economic crisis that would result from widespread freight and passenger rail service disruption," Hamberger said. "We look forward to working with both the House and Senate bipartisan leadership to quickly get the PTC extension across the finish line and to the President's desk for signature."

Something could still go wrong, no matter what Hamberger or anyone else wants. But for now, this is merely another good example of why politics and private industry don't mix well. Now you know. **I**

Don Phillips, a reporter for more than four decades, writes this exclusive column for TRAINS. Email him at: d.phillips@trainsmag.com



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Hidden devices tracking freight cars

Railroads raise alarm on devices they don't control, citing concerns over trespassing and security

Railroads are uncovering hidden freight car tracking devices near rights-of-way around the country.

The discoveries began in early September when a Metuchen, N.J., resident found two people installing boxes near a Conrail Shared Assets Operations right-of-way. Unsatisfied with those persons' answers and the local police response, the resident called Norfolk Southern railroad police, who investigated and found an automatic equipment identification or AEI reader, used to track freight cars by monitoring their built-in radio beacons.

On Sept. 15, the Association of American Railroads' Railway Alert Network issued a security warning to members to keep an eye out for the unauthorized devices. TRAINS obtained a copy of the security alert and broke the story on TRAINS "News Wire."

According to the eight-page report, railroad police investigated further and found that a company called ClipperData had installed the reader. ClipperData was formed about two years ago and sells comprehensive data regarding the energy industry, including the movement of crude oil and other commodities.

According to the report, Norfolk Southern police say they have a copy of a "lease agreement" between a homeowner near the right-of-way and ClipperData, which gave the homeowner \$500 to use a nearby electrical outlet to power the equipment reader. The report also says that railroad police found the first device well covered with "weeds" 23½ feet from the "center of the tracks" with an electrical extension cord running back to the homeowner's house. In an interview with TRAINS, ClipperData CEO Sterling Lapinski confirmed that his company installed the first AEI reader discovered in New Jersey. He says his company's work is legal and that ClipperData is looking at trying to sell data to and about the railroad industry, which is why it installed the AEI reader.

Lapinski says his company sells data and information to government agencies, trading groups, and energy companies.

"We do have devices installed but the network isn't operational yet," Lapinski tells TRAINS. "We're not currently selling data, we're just trying to see if it's feasible."

Railroads around the world use similar equipment-reader technology that uses radio waves to automatically identify freight



Railroaders found this brown-painted automatic equipment identification, or AEI, reader along a railroad right-of-way in New Jersey. Three photos, Association of American Railroads

cars at speed. The equipment readers beam radio waves continuously until they momentarily energize a freight car beacon, which sends its basic information to the reader. Railroads typically gather the information to update their own records before sharing it with other shippers, such as trucking companies, railroads, or steamship lines, and final customers.

Sources close to Class I railroad corporate offices say executives are upset and are



The computer and other components of an equipment box supporting an AEI freight car tracker in New Jersey.

ready to take a hard-line approach to dealing with ClipperData and other companies that may have installed readers throughout the country.

A second security alert, dated Sept. 22, says railroaders have uncovered at least one other equipment reader in New Jersey and one in Sheridan, Wyo. The one in Wyoming reportedly interfered with remotely operated BNSF Railway track equipment, causing it to malfunction.

The Railway Alert Network report raised concerns that the people who installed the equipment readers trespassed on railroad property to do so. It also raises questions about selling data on the movement of specific types of railcars, arguing that the information could be used to "disrupt rail operations through intentional, and potentially destructive, acts." The security alert asks railroads that find similar AEI readers to inform the alert network immediately so that it can consolidate all of the reports.

In a statement to TRAINS, AAR spokesman Ed Greenberg says the organization is keeping a close eye on the situation.

"The AAR was aware of this situation and pleased that local law enforcement and railroad police took steps to address the situation as quickly as possible," Greenberg says.

Norfolk Southern declined to comment. A BNSF Railway spokeswoman responded to a TRAINS' request for comment but did not offer a response before press time. — *Justin Franz*

Former Virginian main line mothballed

Norfolk Southern takes famous West Virginia line out of service amid coal traffic decline

Days of watching loaded coal trains double over the hill to Clarks Gap are over, as Norfolk Southern rerouted trains and abolished all traffic on a section of its ex-Virginian Railway Princeton-Deepwater District in West Virginia.

NS spokeswoman Susan Terpay tells TRAINS that due to the decline in coal traffic, the railroad is phasing out the use of its main line between Elmore and Princeton and rerouting traffic so loaded and empty coal trains will move in and out of Elmore via the Guyandotte Branch. Terpay says local customers at Princeton will continue to be served via the connection at Kellysville.

The famed 50-mile route, once the center of Virginian Railway's electrified operations, features multiple viaducts, tunnels, and a mountainous grade, home to heavy tonnage railroading. The line also hosts famous photo locations, such as Garwood Trestle, Clarks Gap, Matoaka, Princeton, and Kellysville.

All trains to and from Elmore Yard will be routed via Gilbert. Loaded trains will travel west from Elmore Yard via the Guyandotte River Branch to Gilbert and from there, down the ex-Norfolk & Western Gilbert Branch to Wharncliffe, the junction to the Pocahontas District main line. At Wharncliffe, trains with eastern destinations, such as export or domestic



Westbound Norfolk Southern train No. 769 soars across Black Lick trestle in Kegley, W.Va., in December 2012. NS is closing the former Virginian main line. *Samuel Phillips*

utility destinations in southeastern Virginia and North Carolina will follow the main line east to Bluefield and into Roanoke, Va. The routing will be the same for empty trains returning west. The new routing will add approximately 160 rail miles for trains accessing Elmore Yard. Currently, coal trains with western destinations in Ohio, Indiana, or other Midwest points use this route.

Sources close to the railroad said the routing changes were expected to take place as soon as October. The Princeton-Deepwater District, a dis-

tance of about 50 rail miles, was the Virginian Railway's critical link in accessing the coal operations of south central West Virginia. The picturesque line features several impressive trestles, bridges, and a near-2 percent grade. Most trains operated between 18,000 to 20,000 tons, with a rare manned helper operation from Elmore to Clarks Gap. An average of two to four trains operated on the Princeton-Deepwater District in a 24-hour period, excluding light-power helper moves.

The decision to close the district comes as coal traffic on the nation's railroads dropped from 2014, though an NS executive says he expects traffic to steady in 2016. — *Chase Gunnoe*

Cargo thefts from railroads still common

Railroads are reluctant to talk about a problem even insurance companies are unable to size

While burning oil trains grab public attention and security agencies contemplate terror attacks, a criminal underclass continues to do what it does best: steal cargo.

An indication of the extent of the problem is the August arrest of two alleged to have plundered BNSF Railway trains in rural New Mexico. BNSF police investigated the thefts in Torrance County, near Albuquerque, N.M., and were joined in raiding an Albuquerque home by local police and Department of Homeland Security agents.

BNSF spokesman Joe Sloan told TRAINS the investigation is continuing and referred to a written statement that said several burglaries prompted a month-long investigation

and that additional arrests are possible. Homeland Security became involved only after it appeared one suspect was in the country illegally and in possession of stolen firearms. He is now in federal custody on weapons charges. Albuquerque news media say that crooks stole as much as \$200,000 in televisions and laptop computers.

Unsurprisingly, railroads are reluctant to discuss anything related to security, let alone losses from cargo thefts. Few seem to have a handle on how big the problem of cargo thefts, in general, actually is.

“You’ll see estimates of a couple hundred million to billions,” says Frank Scafidi, a former FBI special agent and the West Coast

public affairs director for the National Insurance Crime Bureau. “We really don’t know. Not only are railroad companies reluctant to talk about it, but everybody with a hand in it. Nobody likes to talk about what the potential loss is or what the losses are. From the insurance side, we understand that.”

The lack of data is slowly changing after the insurance industry, citing a provision in the 2005 revision of the USA PATRIOT Act, prodded the FBI to add cargo thefts to its Uniform Crime Reporting system. But recently published crime data from 2013 shows only seven states submitting data from a relative handful of local jurisdictions. — *William P. Diven*

Wick Moorman is on his way

Norfolk Southern's outgoing chief executive ushered in a new corporate culture, heritage locomotives

Wick Moorman served as Norfolk Southern's chief executive officer from Nov. 1, 2005 to June 1, 2015, when he handed the reigns of the company to President and new Chief Executive Officer James Squires. Moorman will serve as a company director through Dec. 31. He recently sat down with TRAINS Correspondent David Lester to reflect on his career.

Q What thoughts do you have on your legacy at Norfolk Southern?

A One of our most significant achievements was to open up the culture of the railroad. Breaking down barriers to communication, emphasizing the need to treat everyone with respect, and ensuring that all employees, regardless of their level in the organization, have the opportunity to contribute ideas and feedback is very important. I credit [Executive Vice President and Chief Operating Officer] Mark Manion with helping to get a lot of this done, along with our many employees who helped make it work.

Q How do you assess the impact of Norfolk Southern's heritage activities?

A As you know, we painted 20 brand-new freight locomotives in the paint schemes of our predecessor railroads, played a role in bringing nearly 30 streamlined diesel locomotives to Spencer, N.C., and introduced the NS 21st Century Steam Program. The demographic profile of NS's employees has changed dramatically during the past 10 years, and the heritage activities provide an opportunity to open the eyes of our younger employees to the history of their industry and their company. They need to understand that today's Norfolk Southern has a long and distinguished history in its predecessor companies over the



Norfolk Southern's Savannah & Atlanta heritage unit leads an empty crude-oil train at Dun-
cannon, Pa., in 2013. Heritage units are part of Wick Moorman's legacy. Michael T. Burkhart



Wick Moorman

centuries, and that so many people have worked hard to make the industry what it is today. When they're out in the field and see one of the heritage units go by, they'll do a double take and ask "what is that?" and learn more from either talking to their colleagues or doing their own research.

When we think about our heritage programs, our first thought is how they will benefit our employees. While we recognize the public relations value of these activities, and greatly appreciate the support of our many fans, we do these things primarily for our employees. These programs do not

stress the railroad financially or physically. Sure, painting the heritage units cost us a little more than painting in our regular livery, but the locomotives had to be painted anyway. All told, with the benefits of our heritage programs greatly exceeding the marginal cost of doing them, the question, for me, is "why wouldn't you do them?"

Q What is your reaction to having Bellevue Yard in Ohio, NS's largest classification yard, named after you?

A This is immensely gratifying. There could not be a higher honor bestowed on me by the railroad. When I think about the yards on our system that are named after former presidents, such as Brosnan [Macon, Ga.] and DeButts [Chattanooga, Tenn.], I am very humbled. This is as cool as it gets.

Norfolk Southern promotes executives in transition to new team

A new order is filling Norfolk Southern's top ranks, following September announcements that Executive Chairman Charles "Wick" Moorman would step down Oct. 1 and retire in December.

From there, the cascade of executives assuming new roles was topped by NS President and CEO James Squires, who became chairman on Oct. 1. Michael J. Wheeler will become chief operating officer upon the retirement of Mark Manion, Feb. 1, 2016. Cindy Earhart succeeds Deborah Butler as executive vice president of administration and chief information officer, and Philip Merilli will become engineering vice president. — Steve Sweeney



James Squires



Michael J. Wheeler



Cindy Earhart



Philip Merilli

» ARRIVALS & DEPARTURES

CSX's Munoz leaves for top airline post

CSX Transportation's one-time operations chief and recently appointed president, **Oscar Munoz**, resigned from the railroad Sept. 8 to become CEO of United Continental Holdings, parent of United Airlines. The abrupt resignation followed a brief scandal at the airline involving its former chief executive. Munoz was replaced as president at CSX by **Clarence W. Gooden**. Several executive vice presidents took new posts in the company including **Fredrik J. Eliasson**, chief sales and marketing officer; **Cindy M. Sanborn**, chief operating officer; and **Frank A. Lonegro**, chief financial officer. **Michael J. Ward** remains chairman and CEO.



Norfolk Southern's **Triple Crown Services** says it will be cutting back service to one Detroit-to-Kansas City-area routing and slash as many as 200 positions. Triple Crown announced the move Sept. 18. Triple Crown is the largest remaining transportation company that uses the famous RoadRailer integrated road-rail trailers. TRAINS: Brian Schmidt

The **National Transportation Safety Board** called for the federal government to directly oversee the **Washington Metropolitan Area Transportation Authority's Metrorail** after the safety board concluded that Metrorail's current oversight panel has little safety enforcement authority. NTSB specifically asked the U.S. Secretary of Transportation to ask Congress for authority to put Metrorail under Federal Railroad Authority jurisdiction. A Maryland-Virginia-District of Columbia panel now oversees the commuter agency.

U.S. Sen. Charles Schumer, D-N.Y., went ahead of **Amtrak's** board of directors in September saying that the board was likely to select **Alstom** to supply new Northeast Corridor trainsets. Amtrak has yet to award a contract for the \$2.5 billion project.

The official 2016 Norfolk Southern wall calendar features color photographs taken by railroaders from around Norfolk Southern's 20,000-mile system. From heritage locomotives to intermodal and special loads – there's something for everyone who enjoys railroading scenes from the Thoroughbred of Transportation. The 11 x 16.5-inch calendar is prepunched for easy handling. Perfect for holiday gift-giving.

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The wreck of Old 54

How can it be that two opposing trains are told to meet at locations 16 miles apart?

My tale begins at the breakfast table on a gorgeous autumn morning, Wednesday, Oct. 12, 1955. I'm 11 years old. My big sister Carolyn and I are getting ready for school. The phone rings. It's my dad, who not 15 minutes earlier left for work at the daily newspaper he owns and edits. Mom listens, hangs up, and turns to me: "Your father said to tell you that two L&A freight trains collided head-on this morning. East of town a few miles. There was a huge fire but nobody is dead, yet. He's trying to rent a plane to get an aerial photo. That's all he knows now."

Let's put this in context. Sulphur Springs, Texas, then is a town of 9,000 people, 80 miles east of Dallas. Nothing ever happens here; even murders over love triangles are a decade apart. This, however, is national news. To me, it's as if a spaceship from Saturn had set down 3 miles from 835 Ardis Street. Trains aren't just part of my life in 1955. They *are* my life. I care not for school, for girls, for small talk, or for what I'll do when I grow up. All that matters is railroads, and I soak up information like a sponge. Yes, I drive my family crazy.

After school, I pedal furiously to the end of Whitworth Street, then walk a mile along the tracks. What a mess. What we call "the L&A" is really the Texas Subdivision of Kansas City Southern Railway, extending from Shreveport, La., to Dallas. Seven of the eight red, yellow, and black F units are splayed across the right-of-way, several on their sides, as are 23 freight cars. Big derricks, one from Shreveport and the other from Minden, La., are already at work, picking their way toward each other through the mess, each derrick tethered to a black GP7. I see track workers constructing a shoofly around the wreckage so that service can be restored. I also see railroad officials wearing cheap suits, neckties, and of course, fedoras.

But strangely, nobody restricts my access to the wreckage. I walk right up to the giant, silent locomotives. They reek of spilled diesel fuel, which to me has the same fragrance as a rose. One of the lead diesels is half buried in dirt. I look directly down into the engineer's side of the cab and see his grip. All six people aboard the engines jumped before the collision, one of them critically hurt when his head struck a culvert. Was it the person whose bag I see? I reach in the grip and pick up a time book inscribed by a man's name, Long. Immediately I feel guilty. I look around, spot one of the fedoras and give him the book. He thanks me and suggests I not get so close to the wreckage.

At dinner that evening, Pop explains there was a "lap order." That is, one train (No. 54) got orders to meet the other at Brashear, 7 miles west of Sulphur Springs, whereas the second train (Extra 76 South) was told to meet 54 at Como, 9 miles east of town. Their rights overlapped, in other words, and they came to grief halfway between the two sidings.

Let's reconstruct that evening. Train 54, headed toward Dallas, pauses at Hughes Springs to set off and pick up cars. There it gets train order 96, issued at 9:40 p.m., which reads: "No 54 Eng 73 meet Extra 76 South at Como." The rear brakeman on 54, William Daum, recollected in a 2011 statement that his conductor thought Brashear would make a better meeting place and asked the Hughes Springs telegrapher to so inform the train dispatcher, G. H. Bland. Bland must have accepted that advice, because at 10:09 p.m. he is



Two Kansas City Southern freights collided at Sulphur Springs, Texas, on Oct. 12, 1955. Sulphur Springs News-Telegram

sues order 97: "No 54 Eng 73 meet Extra 76 South at Brashear instead of Como."

These two orders, read together, are perfectly straightforward. The second order supersedes the first and sets Brashear as the new meeting point. Both orders are delivered to train 54, which leaves Hughes Springs at 10:25 p.m. Daum never feels the emergency brakes at 12:40 a.m. before the train suddenly stops. The collision site is chaotic. Fire trucks are trying to reach the burning wreckage. Neighbors search for crew members. A man living nearby finds the engineer of Extra 76 South, "Flappy" Long, entangled in the stirrup of the ladder from locomotive 76's cab, his elbow and shoulder fractured.

Why did Extra 76 South go past the new meeting point at Brashear? Because it never received order 97! Here is what happened: Dispatcher Bland issued order 95 to the telegraphers at Hughes Springs and Hunt Yard in Greenville that created a work extra in the vicinity of Hughes Springs. The work extra tied up, so Bland issued order 106 addressed to the same telegraphers that read: "Order No. 95 is annulled." But the telegrapher at Hunt

Yard wrote as follows: "Order No 97 is annulled." Both operators repeated the order back to Bland as copied, and neither Bland nor the Hughes Springs operator caught the error. And when the Hunt Yard operator read to Bland the train orders to be delivered to Extra 76 South, Bland did not notice that order 97 was not among them but order 95 was.

The rules that govern railroad operations are written in blood, it is said. In other words, we learn from our mistakes and refine the rules. But short of positive train control (once it is implemented), there is no fail-safe rule against compound human errors. Thus, the wreck of Old 54. ▀

THE RULES THAT GOVERN
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ARE WRITTEN IN BLOOD,
IT IS SAID.

Fred W. Frailey is author of "Twilight of the Great Trains." Reach him at ffrailey@gmail.com. This column was adapted from a TrainsMag.com blog.





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Builders in Tier 4 territory

GEs in production, EMD rolls out demonstrators, other manufacturers tool up under emission rules



Electro-Motive Diesel, delayed in its development of a Tier 4-compliant engine, rolled out the first of five SD70ACe-T4 demonstrators in early October. They'll work on Union Pacific. Ten more demonstrators will go to other Class I railroads in 2016. EMD

As 2015 draws to a close, U.S. locomotive manufacturers are wrapping up their first full year under new Tier 4 rules for locomotive emissions. Tier 4 is the final and most complex of the four stages of federal emission reduction requirements that greatly reduce the amount of pollutants from new and rebuilt locomotives.

Builders, both big and small, have met this challenge with varying levels of success, ranging from refining their product to full production. By the end of September, builders have delivered more than 125 Tier 4 locomotives to Class I railroads.

Here's a quick look at builders and their Tier 4 status as of late 2015:

- General Electric is the only builder so far to produce locomotives in quantity for customers. Richard Simpson, GE vice president-global supply chain, says production of Tier 4 locomotives is in full swing at plants in both Erie, Pa., and Fort Worth, Texas. Simpson says the company is in another round of hiring at its Texas plant that was to wrap up by the end of the third quarter of 2015 in order to meet production demands. The company has said that it received orders for 1,355 Tier 4 locomotives for delivery between 2015 and 2017.

Although GE received Tier 4 certification in late December 2014, delivery of the first production locomotive didn't occur until July 24. During the gap, GE filled orders with Credit User locomotives — Tier 3-compliant units built using earned

energy-saving credits. It also needed time to change its production lines to Tier 4.

GE's fleet of 25 Tier 4 pre-production locomotives continues to provide new performance data; they're also used at training sessions to teach shop employees about the new locomotives.

- Electro-Motive Diesel and its well-publicized delay into the Tier 4 market is coming on strong in late 2015 with demonstrator units under construction at the Muncie, Ind., plant of parent company Progress Rail.

Marty Haycraft, chief marketing officer and senior vice president of locomotive and railcar services for Progress Rail and North America sales for Electro-Motive Diesel, says the company is building five SD70ACe-T4s — the name of the Tier 4 line — this fall. The first of these was completed and shipped for debut at the Railway Interchange trade show in Minneapolis in early October. The locomotive uses EMD's new 1010 engine, which is a 12-cylinder, four-stroke engine utilizing exhaust gas recirculation and diesel oxidation catalyst to achieve Tier 4 emission levels. Progress Rail President and CEO Billy Ainsworth says that while the new 1010 engine shares the same cylinder displacement of EMD's former 265H engines, the 1010 engine is of a completely new design.

Haycraft also says EMD will construct an additional 10 SD70ACE-T4 demonstrators early in 2016. A source close to the matter tells TRAINS that the first five

SD70ACe-T4s built in 2015 will test on Union Pacific while the 10 built in 2016 will be assigned to other Class I railroads.

While GE is the only builder that's delivered new, single-engine Tier 4 locomotives to customers in 2015, a number of smaller builders have delivered Tier 4-compliant locomotives as well.

R.J. Corman is completing a UP order for 14 RP20BD genset locomotives built on new frames. National Railway Equipment produced a two-unit order for the U.S. Army of 3GS21B-DE genset locomotives constructed on new frames. And, using old locomotive cores, Knoxville Locomotive Works shipped a three-unit order for SE10Bs to New York New Jersey Rail.

Cummins plans to begin testing its QSK95 engine in late 2015 on Indiana Rail Road inside locomotive CECX No. 1919, which uses the HTL4200AC model designation. The locomotive was shipped to Brookville Locomotive Works in Pennsylvania earlier this year for completion. It's expected to operate on Genesee & Wyoming's Buffalo & Pittsburgh railroad before moving west to Indiana for completion and testing. The new engine will debut next year inside Siemens' order for 32 locomotives for Amtrak and commuter agencies in the Midwest, California, and Washington.

Expect 2016 to be yet another interesting year to be trackside as these builders and others will bring additional Tier 4 units to market.

» LOCOMOTIVE BRIEFS

Metra adds muscle to its fleet



Metra has taken possession of its first F59PH locomotive purchased from Rail World Locomotive Leasing in 2014. SLC No. 526 is one of three second-hand locomotives the Chicago commuter agency purchased, along with SLC Nos. 530 and 532. The three locomotives were sent to Norfolk Southern's Thoroughbred Mechanical Services in Altoona, Pa., for work and primer paint prior to delivery. After shakedown runs on its Metra Rock Island District, the locomotive was sent into Metra's KYD shop for repainting. Marshall Beecher



Union Pacific SD70ACe locomotives Nos. 8777 and 8778 and natural gas fuel tender UP No. 101 undergo testing at Electro-Motive Diesel's La Grange, Ill., plant in early October. The fuel tender is one of two constructed in the 1990s for LNG testing as UPT Nos. 1 and 2. No. 1 was renumbered CNW No. 1 in 2011, then leased to Canadian National for LNG testing from August 2012 to September 2013 before returning for more modifications and renumbering to UP No. 101. Craig Douglas



Norfolk Southern repainted SD45-2 No. 1700 into its original Erie Lackawanna colors at its Chattanooga, Tenn., shops. The locomotive was the first of 13 ordered by the predecessor railroad. The unit will enter revenue service, joining the fleet of five additional 1700-series units assigned to the Conrail Shared Assets. NS: Casey Thomason

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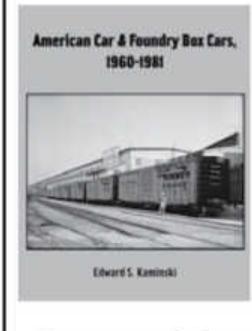
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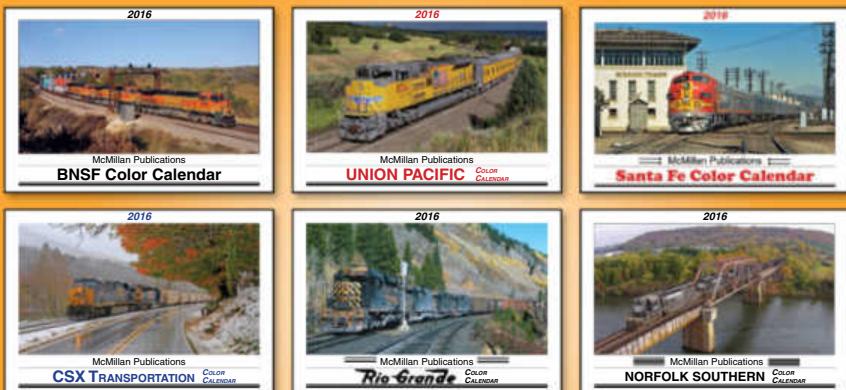
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Where are we at with PTC?

Forget Congress, real technical challenges remain with adopting safety systems nationwide

All business and technical projects

generally operate on a timeline — when the project will start, when it is scheduled to be complete, and various milestones in between. A simple framework for information technology projects, for example, is to design, build, test, correct problems and retest, train staff, then implement.

While positive train control cannot be considered an information technology project, multiple IT projects are part of its development. Indeed, PTC has often been referred to as a “system of systems,” which speaks to the multitude of hardware and equipment components involved, as well as the software components which, for an entire PTC implementation on one Class I railroad, can exceed one million lines of computer code.

PTC is also a train control project governed by federal laws on railroad signaling. Regulatory oversight of PTC adds a layer of complexity not seen in traditional IT projects.

A key challenge of PTC implementation has been the limited amount of expertise to design and develop it. This is because much of the technology has had to be built from scratch, and is not something that can be bought off the shelf. Some of the PTC devices for locomotives took longer to build than expected. And a Federal Communications Commission-driven delay in antennae installation due to historic preservation issues cost the railroads a year of work. The functionality of software

has had to be designed, then code written and tested to ensure that it works as intended. While much of this has occurred in a laboratory environment, the real testing begins on the rail-

Upgrades or new installations needed for PTC nationwide

- Locomotives 18,000
- Wayside interface units 38,000
- Signal installation/replacement 12,000
- Signal modifications 4,900
- Back office systems 30

Source: FRA



This equipment shed in West Chicago, Ill., alongside Union Pacific's main line is just one of thousands that will need to work with PTC systems. TRAINS: Steve Sweeney

road itself, which is an active business running trains and serving customers — certainly not ideal test conditions.

One of the many significant PTC challenges is the robust testing and retesting of the numerous software components of the system. For example, Frank Lonegro, CSX Transportation's chief financial officer and one-time head of the industry's PTC interoperability committee, says that, essentially, all of the components for PTC have been installed on CSX's Wilmington Subdivision. That route runs from Hamlet to Wilmington, N.C., a distance of a little less than 100 miles.

Lonegro points out that this is one of the less complicated places for field qualification testing of PTC. The line is relatively flat, and there are no crossings with other Class I railroads. Even in these close to

“pristine” conditions, Lonegro says that “we have found critical and severe defects in the software” that have to be fixed and retested. As field qualification testing is initiated on other, more complex, sections of the railroad, this will challenge the software even more, and the testing and retesting cycle will continue.

Mike Rush, senior vice president of safety and operations at the Association of American Railroads, says, “All railroads that have undertaken testing have had experiences similar to those of CSX.”

One testing requirement is known as regression testing. Let's say, for example, that a particular software component is working as designed, except for two severe defects in the code that have been discovered through testing.

Once these defects are fixed, the rest of

» PTC estimates for selected U.S. railroads as of September 2015

	BNSF Railway	CSX	Long Island Rail Road	Metra	Metrolink	Norfolk Southern	Reg'l Trans. Dist. (Denver)	Union Pacific
ROUTE-MILES*	11,350	11,067	314	438	225	9,560	35	21,009
TOTAL COST*	\$2 billion	\$1.9 billion	\$444 million	<\$400 million	\$216.5 million	\$1.8 billion	\$22 million	\$2.5 billion
FINISH DATE	Dec. 2017	Dec. 2020	Dec. 2018	2019	Dec. 2015	Dec. 2020	2016	Dec. 2018
ENGINE RE-FITS*	6,000	3,900	776	526	109	3,400	56	6,532

Source: Government Accountability Office report to Congress. Notes: Selected railroads are representative. *Expected totals

the functionality in the software component must be regression tested to ensure that the fix did not break something else in the code. These multiple rounds of testing require a great deal of time and care in order to ensure the system is working properly and is safe.

According to a report released by the Federal Railroad Administration in August, the AAR projects that by the end of 2015, railroads will have 39 percent of locomotives fully PTC equipped; 76 percent of wayside interface units will be installed; 67 percent of base station radios will be installed; and 34 percent of required employees will be trained.

While different Class I railroads are at slightly different points in their work on PTC, a key upcoming step is revenue service demonstration. Norfolk Southern's Eric Hullemeyer, director of advanced train control systems, says "we have different territory types where [revenue service demonstration] will take place in late 2015." And AAR's Rush says "All Class I [railroads] will be in the revenue demonstration phase by [the second quarter] of 2016."

Undoubtedly, more issues and problems will be found during revenue service demonstrations. But, this is a normal part of the process, and the Class I railroads say they have demonstrated significant progress by reaching this milestone.

» TECHNOLOGY BRIEFS

Cummins delivers prime movers

In October, Indiana-based Cummins delivered its first QSK95 diesel prime movers to Siemens. The company says its engines will power Charger locomotives built in Sacramento, Calif., that are destined for use in California and the Midwest. The 16-cylinder high-speed engines are capable of 4,400 hp. The engines are designed to achieve U.S. Environmental Protection Agency Tier 4 emission standards by treating the exhaust as it leaves the engine.

Chicago-based commuter agency Metra will equip 10 passenger cars with free Wi-Fi by January to determine whether the technology will provide consistent access to the Internet. Metra CEO Don Orsino says that if customers like the level of service and it's financially feasible, Metra will seek funding or sponsorships to install Wi-Fi on more of its commuter cars. The six-month project will cost about \$35,000.

» Read up on PTC basics from TRAINS:
www.TrainsMag.com/PTC

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"CN's ex-EJ&E Leithton Subdivision"

Since its takeover by CN in early 2009, the former Elgin, Joliet and Eastern has undergone dramatic change. Both BNSF and UP have overhead rights on this busy line. This shows 24 hours of action on the former EJ&E, now CN Leithton Sub, northwest of Joliet, Illinois in April of 2015. 1 hour, 52 minutes. DVD or Blu-ray \$34.95.

"UP's ex-CNW Frac Sand Main"

This video documents the recent increase in trains on the former CNW Twin Cities Line. Nearly 70% of the sand used for fracking comes out of Wisconsin and UP handles the largest share. This DVD shows parts of three days and one night of action between Weyerville and Ashippun, 38 miles west of Milwaukee in April of 2015. 1 hour, 16 min. DVD or Blu-ray \$32.95.

"The Cal-P, UP's Martinez Sub"

The Cal-P, short for California Pacific, now UP's Martinez Subdivision, is their busiest freight line into the Bay Area. 34 Amtrak trains use this line where we videotaped. This program shows this amazing passenger rail renaissance with over 24 hours of action on UP's Martinez Sub west of Davis, California in October of 2014. 58 minutes. DVD or Blu-ray \$30.95.

"The Transcon in Eastern Arizona"

If you want to see the greatest show in freight railroading in this country, head to the former Santa Fe, now BNSF main line between Chicago and Los Angeles known as the Transcon. This shows over 24 hours of awesome action during the height of the fall container rush between Holbrook and Winslow in eastern Arizona, in October of 2014. 2 disk set. 3 hours, 19 minutes. DVD or Blu-ray \$44.95.

"UP Sunset Route in the Sonoran Desert"

One of the hottest places on Union Pacific's Sunset Route, both in the pace of the operations and the temperature, is on their Yuma sub in the Sonoran Desert in Southern California. This shows over 24 hours of fast paced action on the third busiest transcontinental in the country between Indio and Niland in October of 2014. 1 hour, 28 minutes. DVD or Blu-ray \$34.95.

"Eastern Trunk Lines in Northwest Ohio - NS"

This shows over 24 hours of action in April 2014 on one of the two remaining eastern trunk lines - the former New York Central, now Norfolk Southern Chicago Line in northwest Ohio between Toledo and Oak Harbor. NS had some congestion around their system at this time, especially getting into Chicago. 2 disk set. 2 hours, 33 minutes. DVD or Blu-ray \$40.95.

"Eastern Trunk Lines in Northwest Ohio - CSX"

This program shows over 24 hours of action in April of 2014 on the former B&O, now CSX, line to Chicago in northwest Ohio on their Garrett Sub, with a few trains filmed in Indiana. With nearly every class I railroad short on power, the head end of trains on this program was as colorful as it has ever been with foreign power on many of the trains. 2 disk set. 3 hours, 16 min. DVD or Blu-ray \$44.95.

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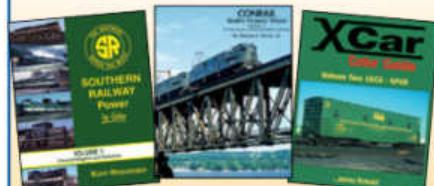
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A new day for bikes and baggage

Amtrak debuts more roll-on bike options but threatens fines for bringing too many bags aboard



Assistant conductor Dorothea Bowes watches Pittsburgh resident Oscar Petite Jr. prepare to leave the *Capitol Limited* in Washington, D.C., on Sept. 16. Wall paneling dates from the Superliner's nine-year conversion to a "smoking coach" in 1996. Four photos, Bob Johnston

Just in time for fall colors, Amtrak strategists were able to work out logistics that enable cross-country bike riders to roll their two-wheelers aboard the *Capitol Limited* at any station between Chicago and Washington, D.C. They can secure the bikes on wall-mounted racks in the lower level of a Superliner coach-baggage car.

Beginning with the delivery of the California Cars' built-in holders in the mid-1990s, states sponsoring trains have increasingly responded to customer demand by expanding roll-on bike offerings. But on Amtrak's solely financed services, bicycles are only welcome in a dismantled state as checked baggage at agent-staffed stations, which continue to be eliminated. (Among this summer's casualties: Hastings, Neb., Winona, Minn., and Grand Forks, N.D.)

Deborah Stone-Wulf, Amtrak's vice president of sales and customer service, says the company established a "Bike Task Force" that selected the *Capitol Limited* for a bicycle roll-on pilot test two years ago because of the 330-mile scenic bike-trail system paralleling the train's Pittsburgh-Washington, D.C., segment. "It took some time for us to develop an inexpensive, lightweight bike rack that could be used in Superliner bag-coach cars," she tells *TRAINS*, "and to identify a design that allowed us to increase (capacity) to eight racks." Ten cars were converted, including one assigned to the Oklahoma City-Fort Worth, Texas,

Heartland Flyer.

Oscar Petite Jr. became the first east-bound bicyclist to use the *Capitol Limited* service on Sept. 16, three days after its debut. "Once word gets around that all you have to do is hang your bike up instead of taking it apart and boxing it, this is going to become very popular," Petite predicts. To make reservations at www.amtrak.com, click the "add bike to trip" button; the fee is \$20.

In North Carolina, roll-on bike carriage requires reservations but is free from Charlotte to Raleigh. Since May, the *Carolinian* has been the first train equipped with new Viewliner II baggage cars to offer a service the state has always provided on its two *Piedmont* round trips between those cities. Rail Division Deputy Director and Manager of Operations and Facilities Allan Paul says the state pushed hard to get the new bicycle-rack-equipped cars because not having them on two of six trains caused confusion among riders who might use the service as part of a daily commute. "They provide an essential part of our service," he says. But leasing those cars costs thousands of dollars per month, an additional expense that has made states like Pennsylvania, New York, and Vermont, whose sponsored trains don't have baggage cars, think twice about adding the new Viewliners.

The *Carolinian* debut has helped ad-

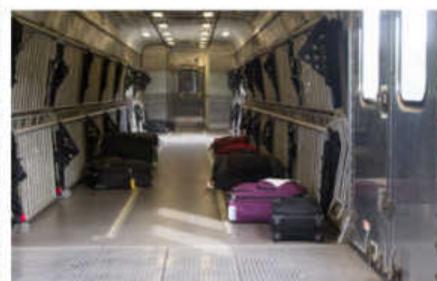
dress other challenges, such as identifying how riders move through stations to platforms and developing crew training for loading procedures. Amtrak added baggage cars to some *Northeast Regional* trains Sept. 15-30 for the Union Cycliste Internationale Road World Championships in Richmond, Va., to allow roll-on bikes between there and Philadelphia, but didn't make the same provisions on trains operating south of Richmond.

Amtrak's Stone-Wulf says the company "will soon start rolling out (unboxed) bike service on routes that have the new bag cars. We are still working to determine the exact schedule," she says, and "are considering adding the cars to some Northeast Corridor trains" that don't carry them now.

With the holidays approaching, having the new Viewliner IIs operating throughout the system is good news for travelers that risked ruined suitcases in previous winters as blowing rain, snow, and dirt blasted into 1950s-era cars with doors that wouldn't close.

Meanwhile, despite the ever-shrinking number of staffed stations and lack of trains carrying baggage cars outside of North Carolina, California, and the Pacific Northwest, Amtrak has been telling passengers that beginning Oct. 1, it is enforcing a new rule that strictly limits carry-ons for each ticketed traveler to two large suitcases (50-pound maximum) and two "personal items" (no larger than 25 pounds and 14 by 11 by 7 inches each). Exceeding those limits — up to two excess items are permitted — will cost the traveler \$20. "Any luggage in excess of the policy will be subject to a fee per violation," advises a guide distributed to passengers, though the amount is only disclosed on the website.

Amtrak dropped the number of free checked bags from three to two in early 2013, while also adding a \$20 charge for a



A Viewliner II baggage car rolling north Sept. 15 on the *Crescent* has plenty of room for bicycles and more luggage.



Suitcases awaiting the arrival of the northbound Carolinian at Raleigh, N.C., on Sept. 18 can only be checked to staffed stations. At other stops, all luggage is carry-on.

limit of two extra bags. The most-recent “Baggage Policy Passenger Guide” said “additional personal items permitted include: required medical devices; pillows, blankets, and outer garments; coolers, purses, or small bags no larger than 12 by 12 by 12 inches, and small electronic devices with protective cases.” The new rules clearly imply that any of these items count against the two-item carry-on limit.

Enforcement of existing rules has been arbitrary, with station agents or caretakers at unstaffed stations explaining carry-on restrictions only to see the train conductor allow overloaded passengers to board or be forced to leave excess baggage behind. The new policy may seem like a combination

money-maker and deterrent to bean counters at headquarters who spend little time riding trains. But the idea that “fees will be collected at the station or onboard the train if the station is unstaffed” won’t eliminate the decision that only frontline employees must make, putting them in the no-win position of incurring either the wrath of management or the customer. (“Sorry, you either have to leave that pillow behind or give me \$20.”) This is not a recipe to encourage ridership growth.

A better solution would be to find a way to utilize empty space in the recently arriving baggage cars (TRAINS spotted No. 58 of the 70-car order on Sept. 20). Even taking into account space needed for

>> PASSENGER BRIEF

New bilevels delayed

Nippon Sharyo suspended production at its Rochelle, Ill., plant on an order for 175 California and Midwest-bound bilevel passenger cars following a compression test failure on a newly designed prototype shell. Production is halted until the cause is determined, a remedy is established, and a revised prototype is re-tested. The delay puts completion of the entire project in jeopardy because the \$551 million appropriated from 2009 stimulus funds must be spent by Sept. 30, 2017.

future bicycle traffic, a September journey aboard the *Crescent*, *Silver Star*, *Carolinian*, and *Lake Shore Limited* found room in the brightly lit, heated baggage cars on each train while bag towers and luggage racks were overloaded in jammed coaches.

“That’s not my job” is a continuing issue in labor contracts, but pleasing customers needs to be everyone’s focus to ensure repeat business. Figuring out how to best use the cars would also eliminate second-class status for passengers boarding at Amtrak’s numerous unstaffed stations. Until a comprehensive baggage plan is implemented, college students attempting to bring home a bag of dirty laundry had better think twice about taking the train.

Lure of Vegas tempts China

When U.S. won’t invest in passenger-rail infrastructure, Asian firm steps in

High speed Chinese-designed trains could someday speed passengers between Las Vegas and Southern California if a joint venture between China Railway International and Xpress West Enterprises moves beyond the \$100 million initial investment the foreign company pledged in September.

The initiative is the latest attempt to re-establish service that Amtrak abandoned when it discontinued the Los Angeles-Salt Lake City-Chicago *Desert Wind* on May 10, 1997. Amtrak itself proposed running a Talgo trainset between Los Angeles Union Station and Las Vegas, but the project was delayed by an environmental study and finally spiked when Amtrak teetered on the brink of bankruptcy in 2002. Subsequent proposals to provide an alternative to congested Interstate 15 included Union Pacific and BNSF Railway tracks with an overnight luxury cruiseliner and the Las Vegas-based X Train, which negotiated a



A Chinese-built high speed trainset prepares to depart Beijing for Tianjin in August 2011. Equipment for the proposed U.S. venture has not been revealed.

now-cancelled agreement with UP but has been unable to reach one with BNSF for a Fullerton, Calif., terminus.

Xpress West, originally formed in 2002 as Desert Xpress, proposed constructing a 185-mile dedicated right-of-way next to the Interstate ending in Victorville, Calif.,

85 miles from downtown LA. It would support 150-mph trains. The company has the necessary environmental approvals but was unable to secure a federal \$5.5 billion Railroad Rehabilitation and Improvement Financing loan in 2013, primarily because the Las Vegas-based company would not commit to “Buy America” provisions.

The Chinese have proposed a 230-mile route which would extend high speed service to Palmdale, Calif., a station closer to Los Angeles served by Metrolink commuter trains and the proposed California High Speed Rail Authority service. In May, Nevada established a rail authority to oversee development, but the project’s future will depend upon how much the Chinese are willing to invest in order to get a toehold in the unpredictable U.S. high speed rail market, and what kind of a cut of future ticket revenues they will expect once service begins.

O

n a sunny January afternoon, two brown pelicans patiently wait for a possible handout from a pair of fishermen casting from the banks of the Miami Canal at Lake Harbor in South Central Florida. An egret balances on a rail of the nearby South Central Florida Express railroad pile trestle. Far to the east comes the sound of a locomotive horn blowing for a highway grade crossing. Fishermen, pelicans, and egret do not seem to notice. But

within a few minutes the sound of a hard-working locomotive can be heard, and continues to grow in volume. Although no train can be seen down the tracks, the pelicans forget about an early fish dinner and fly away.

At last a headlight is visible over a distant rise, and the roar of a single turbocharged EMD 645 engine becomes even louder. The egret takes flight just as the train charges across the bridge at a respectable 35 mph, with a GP40-2, built for the Boston & Maine in 1977, moving 92 open-top cars overflowing with sugarcane stalks.

This is just another day during United States Sugar Corp's six-month harvest season — a time that employees call "The Crop." From October until early April, U.S. Sugar workers and the employees of the company's two railroads toil nonstop seven days a week, even on holidays, to cut, move, process, and refine sugar grown on nearly 312 square miles of owned and leased farmland surrounding much of the southern half of giant Lake Okeechobee. U.S. Sugar's private railroad and common carrier South Central Florida Express strive to have all cane start its processing at the Clewiston, Fla., mill within hours from the time it arrives at the tracks.

Just four states — Florida, Louisiana, Texas, and Hawaii — grow sugarcane commercially. Florida produces the most, and U.S. Sugar can boast of having the state's largest output. In stores, its products carry the label of United Sugars, which is a separate company. U.S. Sugar has long been familiar to railroad enthusiasts because of its extensive private sugar railroad. Steam locomotives led U.S. Sugar cane trains until the early 1960s. Since 1994, U.S. Sugar has been in the common-carrier railroad business, too, with its subsidiary South Central Florida Express Inc. (reporting marks SCXF) giving



the sugar company and other on-line businesses access to the national rail network. South Central also moves cane from U.S. Sugar's outlying fields to the processing plant. All cane grown for U.S. Sugar moves from the fields by rail to the huge mill and refinery complex at Clewiston. U.S. Sugar's railroad operations manager, Mickey Watson, says that the railroads are a matter of efficiency. Each railcar of cane takes at least three truckloads off the area's limited road network.

When TRAINS last visited U.S. Sugar in 2009, ("A Sweet Ride No More?" September 2009), author Frank Kyper reported on what could well have been the end for much of the region's sugar farming and a resulting bleak future for U.S. Sugar's railroads. One year earlier, the administration of Gov. Charlie Crist had entered into an agreement with U.S. Sugar so a regional water management district could purchase all of the company's properties for \$1.75 billion. The cane fields would be used to restore wetlands at the northern edge of the Florida Everglades. The agreement called for all U.S. Sugar farming and processing to end by 2014.

Fast forward six years. A faltering world economy and increasingly scarce state funds resulted in two reductions in the scope of the project and the elimination of the requirement that U.S. Sugar end its sugar farming and processing. In 2010, U.S. Sugar sold 41 square miles to the water district, but less than half of that property had

been used for sugar farming. In 2014, even as the possible sale of cane fields for Everglades restoration was under discussion, U.S. Sugar teamed up with another local grower to propose "Sugar Hill," a long-term project that would eventually see 18,000 new homes and extensive commercial development on 67 square miles west of Clewiston. Local officials approved the initial concept, although further state review is required. Some of the proposed development area included U.S. Sugar land, which had been included in the Everglades project. As 2015 ends, U.S. Sugar remains a thriving company and its rail operations have expanded since 2009.

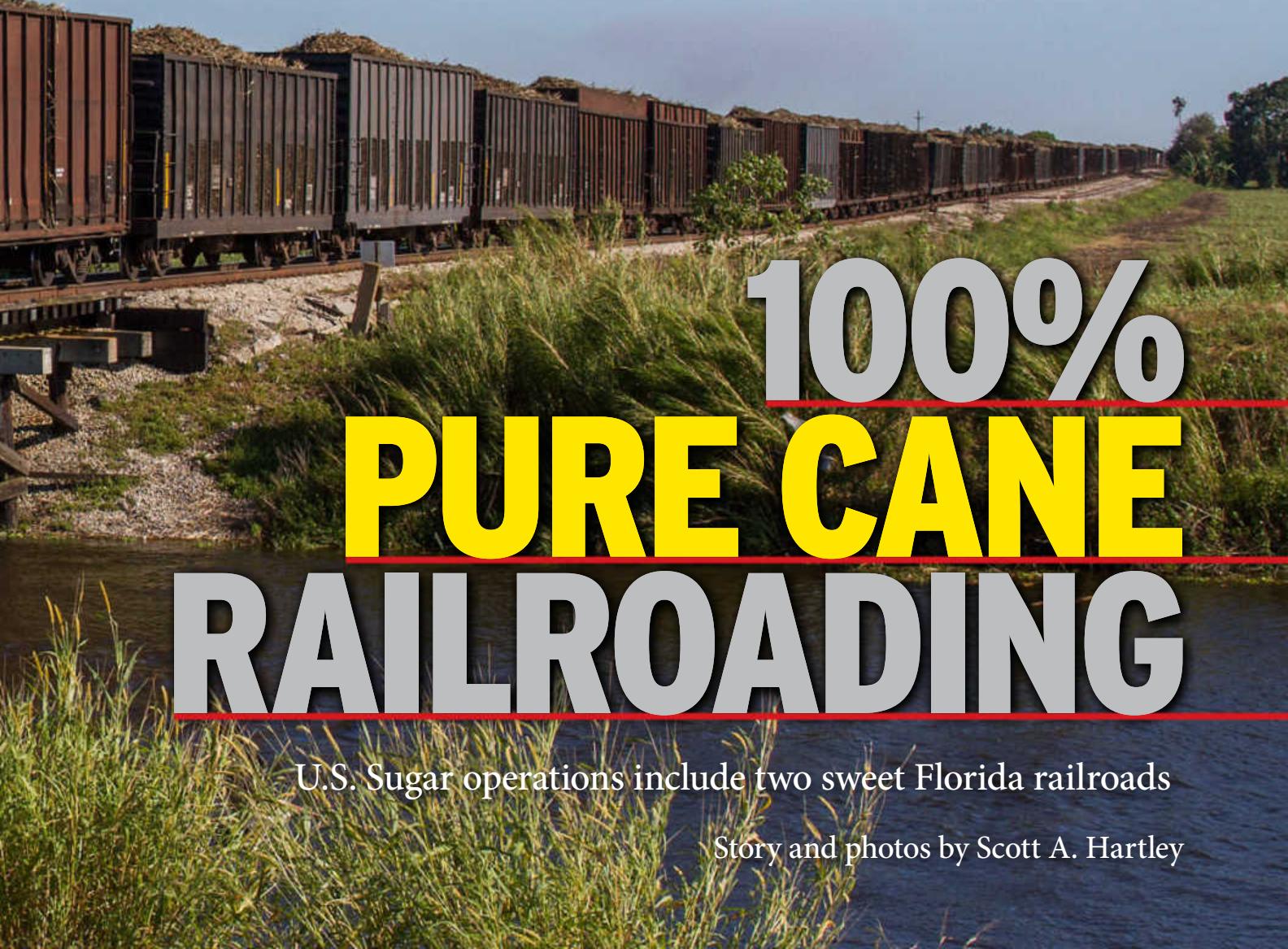


Sugarcane is cut into foot-long stalks for transport and processing.

ABOUT THE COMPANY

The United States Sugar Corp. dates to 1931, when northern manufacturer and entrepreneur Charles Stewart Mott purchased a bankrupt sugar company in Clewiston. The company has expanded since then and acquired other agricultural businesses in the Lake

A South Central Florida Express Bryant Turn, consisting of 92 loaded cane cars en route to U.S. Sugar's Clewiston mill, crosses the Miami Canal at Lake Harbor, Fla., in January 2015.



100% **PURE CANE** **RAILROADING**

U.S. Sugar operations include two sweet Florida railroads

Story and photos by Scott A. Hartley



U.S. SUGAR CORP. RAILROADS AND CONNECTIONS AS OF 2015

FROM FIELD TO RAIL

1 A convoy of harvesters cut cane at Moore Haven, Fla., at sunset on Jan. 27, 2015.



Okeechobee region. The railroad also serves U.S. Sugar subsidiary Southern Gardens Citrus, some 10 miles west of Clewiston. The company is the largest supplier of "not-from-concentrate" orange juice from Florida.

For more than 50 years, U.S. Sugar has operated two separate sections of private railroad. Today, 38 route-miles of private railroad, with trains operated by U.S. Sugar personnel, radiate from Clewiston. An additional 36 miles of sugar railroad serve the Bryant area.

U.S. Sugar entered the common carrier railroad business in 1994 when it purchased the South Central Florida Railroad from Lukens Inc., a Pennsylvania steel company that had acquired from CSX Transportation the 91 miles of former Atlantic Coast Line trackage from Sebring through Clewiston to Lake Harbor and Okeelanta just four years earlier. Renamed the South Central Florida Express, the line was made a separate corporation from the sugar company because some of the new railroad's customer list includes U.S. Sugar competitors. With South Central, U.S. Sugar-owned trains could directly serve 10 cane loading elevators located on the former CSX Transportation trackage.

South Central Florida Express nearly doubled in mileage in 1998, adding 71 route-miles when the railroad entered into an agreement with Florida East Coast to operate from Fort Pierce to Lake Harbor. Today, South Central runs to Fort Pierce five days a week to interchange with FEC. Interchange cars to and from Norfolk Southern move in FEC trains between Fort Pierce and Jacksonville.

FEC trackage became important to U.S. Sugar following the closure of the company's second mill at Bryant in 2007. All cane grown in that region now moves in solid trains over the South Central to the Clewiston mill and refinery. South Central trains also serve four other cane-loading sidings on the FEC tracks. To accommodate the increased traffic and the South Central's 100-car Bryant Turns, the railroad built a new 5,175-foot passing track near the city of South Bay, naming it "Buker Pass" after U.S. Sugar President and CEO Robert H. Buker Jr.

U.S. Sugar added 9 new route-miles to its private sugar railroad in 2013, with one new elevator plus a 3-mile spur and five yard tracks, leading to subsidiary Southern Gardens Citrus. For now, the plant is shipping out cars of cattle feed, a by-product of the citrus juice-making process.

U.S. Sugar modernized and expanded the original Clewiston plant several times, and replaced it in 1998 with an integrated mill



2 Tractor-hauled trailers dump cane onto a large conveyor to load railcars in November 2014.



and refinery. The 5.5-acre, 300,000-square-foot facility has the capacity to process 600,000 tons of sugar a year.

PROCESSING SUGARCANE

Sugarcane is a tall, tropical grass. Each cane plant will yield four or five annual harvests, and a field will be replanted after that period. Prior to cutting fully grown cane, large, controlled fires burn off all of a field's cane leaves. Giant harvester machines work in parallel, cutting several cane rows at once into foot-long sections. These are sent into tractor-drawn triple trailers that keep pace with the cutting. When filled, each trailer unit breaks away from the convoy and heads to a loading "elevator" along U.S. Sugar or South Central tracks.

During harvest, U.S. Sugar has daily and weekly crop plans in which cane field managers and railroaders schedule where cane

An empty Bryant Turn holds in the siding at Bunker Pass in South Bay as a loaded train en route to Clewiston passes on the main line in January 2015.

will be cut and where it will be loaded onto railcars. U.S. Sugar trains can move up to 40,000 tons of cane a day. The mill processes the cane around the clock during the six-month harvest.

Two major manufacturing steps are required between the time the cane stalks arrive at the mill and when it's ready for making cookies. The mill portion of the Clewiston complex produces raw sugar at twice the rate that the refinery can process it into consumer sugar. As a result, the refinery operates 51 weeks per year producing household sugar, while the mill shuts down for several months of summer repair. Among the complex's by-products are molasses and "bagasse," a fibrous fuel that is used to power the mill's steam plant.



3 A South Central Florida Express train picks up loaded cane cars in December 2013.



4 Loaded cane cars enter one of the two dumpers at the Clewiston mill and refinery in December 2013.



South Central Florida Express interchanges with Florida East Coast at Fort Pierce. NS interchange cars move through here, too.

SWEET OPERATIONS

Sugar Yard, on the east side of U.S. Sugar's Clewiston mill and refinery complex, is the center of operations for both railroads, and is the one point where both U.S. Sugar and South Central trains operate. Elsewhere, crews of each railroad are authorized to run only on their own routes.

During the sugar harvest, U.S. Sugar's yellow-and-gray locomotives behave like so many honey bees, hurrying out and quickly returning with their sweet cargos. The activity occurs day and night for the six months of "The Crop." On the sugar railroad, four road trains cover the lines out of Clewiston during every 24 hours, while five more jobs cover the switching at Sugar Yard and dumping chores at the mill. Locomotives at the dumpers were equipped for remote control operation in 2015. At Bryant, an additional four train crews work during each 24-hour day. South Central Florida Express is even busier, with nine "cane jobs" working out of Clewiston every 24 hours, plus four Bryant Turn crews each day.

Sugar Yard's yardmaster oversees all movements at the mill as well as the sugar railroad's lines out of Clewiston. Most switches in Sugar Yard were motorized in 2015, allowing the yardmaster to

Sugar Yard is seen from the locomotive cab of a loaded U.S. Sugar road train in December 2013. EMD switchers handle yard and dumper work.



route train movements. A counterpart at Bryant looks after trains there. South Central Florida Express is dispatched by a control supervisor at the Clewiston Control Center in the railroad's office building. South Central has its own operating rules that include permissive blocks, written to ensure safe operation of more than one train in a specified area. The sugar railroad has similar rules. A new digital radio system provides clear communication to all ends of the rail system.

The only year-round trains are South Central Florida Express' Monday-to-Friday turn to Fort Pierce, a three-day-a-week Sebring Turn, and a weekday local, based out of Clewiston. The railroad serves 26 customer locations, in addition to its U.S. Sugar sidings.





Major contributors to the railroad's car counts are two U.S. Sugar competitors: Sugar Cane Growers Cooperative at Belle Glade and Florida Crystals Corp. at the end of the 18-mile branch to Okeelanta. Other major commodities include aggregates and agricultural supplies.

Each railroad has its own conductor and engineer roster, as well as separate maintenance-of-way forces. Much of both railroads feature recently installed 136-pound continuous welded rail. Maximum authorized speed on the sugar railroad is 35 mph. On South Central Florida Express, conventional freight trains are allowed 40 mph, while cane trains are held to 35 mph.

THE FLEET AND THE FUTURE

In 2009, much of U.S. Sugar's cane car fleet rolled on solid metal "friction bearings," equipment long prohibited from interchange service. Improved logistics enabled the company to cut the fleet from 1,100 to approximately 825 cars. Each of those now have roller-bearing trucks. The company continues to replace older wood-sided cars with new all-steel cars reconfigured from boxcars by outside contractors. Cane cars have screen doors on one side, hinged at the top, permitting loads to empty when the cars are rotated 45 degrees into Clewiston mill dumpers.

Locomotives in the all-EMD fleet now carry U.S. Sugar "USSC" reporting marks and wear the official yellow-and-gray corporate colors. Gone is the orange-and-blue scheme formerly carried on South Central units. Today, the former South Central shop near downtown Clewiston handles locomotive servicing and running repairs, while the South Shop performs heavier work.

Consolidating the rosters and maintenance has allowed for fewer locomotives, says U.S. Sugar engineering manager Derek DuPlooy, whose duties included overseeing locomotive maintenance until recently. All locomotives now carry Federal Railroad Administration "blue cards," allowing them to operate in any service on either railroad.

A U.S. Sugar Railroad road train crosses a drainage canal south of Clewiston, with a long cut of empty cane cars headed for loading in January 2015.

In recent years, U.S. Sugar purchased secondhand EMD switchers and road-switchers and contracted with locomotive rebuilders for their overhaul and modernization to Dash 2 standards. The current favorite is the 3,000-hp GP40-2, which has the extra strength required to handle the Bryant Turns as well as the long Sebring and Fort Pierce Turns.

"The GP40s can pull 100 cars, with 6,500 trailing tons, at 35 mph all day long," says operations manager Watson. U.S. Sugar has five GP40-2s, with a sixth on its way. Five GP38 derivatives and the dwindling roster of former Illinois Central-rebuilt GP11s are still needed on the sugar jobs, too, Watson says.

The clean condition of the company's locomotives is purposeful. "That engine is the ambassador of our company," DuPlooy says. "If an engine looks good, people will think that this is a good company." An advanced painting schedule means that each EMD gets fresh paint every six or seven years.

That forward-looking mind-set puts U.S. Sugar and its railroads in good standing as they adapt to changing business conditions.

The 2008 threat of total shutdown of U.S. Sugar seems to have passed, and "Sugar Hill" has a 46-year timetable. It is likely that Clewiston, where highway billboards welcome visitors to "America's Sweetest Town," will continue to see the flurry of cane trains for years to come. **I**



A South Central Florida Express sign greets visitors to the railroad's headquarters in Clewiston.

GUILT TRIP TO THE WORLD'S ROOFTOP

The Qinghai-Tibet railroad is a marvel,
but at what cost and to what end?

by Albert Tay



Beijing garnered global attention during the 2008 Olympics, but the Olympics of railroad construction came to China in 2006. A record-breaking line, 710 miles long and reaching elevations above 16,000 feet, was completed in July that year, the final link in a railroad from the Chinese capital to Lhasa, Tibet.

The tenuous bond I made with Tibet during my ride on this railroad is tinged by the dilemma of visiting a beautiful but tragic land. It weighed on my conscience that I had provided tacit support to a draconian regime.

Superlatives come easily when describing the tests

that were overcome in building the last link from Golmud to Lhasa. But there are so many negatives that the project has rightly been called the most controversial railroad in the world. The engineering achievements may have been overshadowed by concerns about human rights, social costs, cultural genocide, and the environment. I still feel guilty about the trip I made in June 2007. You could say that this account is a form of confession.

FIRST IMPRESSIONS

The timetable cover depicted something like the latest model of Japan's Shinkansen. A propaganda

poster lauding official development plans in Tibet showed a futuristic-looking train, as well. The Chinese project had cost \$4.2 billion and terms like "engineering marvel" had been bandied by the government. In spite of all that, the dimly lit platform at Beijing West Terminal had the feel of a movie set in the Cold War era. The track, locomotive, and cars looked decidedly 20th century. I lowered my expectations immediately.

China built the Great Wall and it may be the factory of the world, but the critical high-altitude locomotives were made by General Electric. A total of 78 5,100-hp diesel-electric C38AChe locomotives

were built at GE's Erie, Pa., plant for \$150 million. These six-axle machines are derived from North America's ubiquitous C44-9W. High-altitude operation dictated significant modifications to cooling and ventilation systems, however, which needed to handle greater volumes of thin air than conventional locomotives at lower altitudes. Pressurized cabs with oxygen systems are another modification from the units' American cousins, as is a fuel-transfer system that enables fuel to flow between units.

The Tibetan Plateau is one place you don't want to be stuck, so the "Lhasa Express" trains from Beijing have two locomotives on

After circling north of the city, an inbound train enters the outskirts of Lhasa, Tibet, in September 2011. Bob Johnston





A brief stop at Xian, the eastern terminus of the ancient Silk Road, sees more passengers board the train to Lhasa.

the head end.

The cars were built by two Canadian companies, Bombardier and Power Corp., in partnership with China South Locomotive & Rolling Stock Industry Corp., a state-owned enterprise now known as CRRC Corp. The joint venture supplied 361 cars under a \$281 million contract. During my journey, the train carried eight cars west of Xining.

The cars were designed to last 30 years, but given the tough operating conditions, I do not relish the thought of a return

trip three decades after they were built. The cars' steel body shells and frames are designed to withstand impact forces of up to 134 tons — just 40 percent of the European standard.

The Tibetan Plateau's atmosphere has 40 percent less oxygen than air at sea level, so the Bombardier consortium had to supply oxygen outlets for every seat and sleeper. Ultraviolet light protection is a necessity, too, especially for the windows. Passengers, crew, and sensitive equipment are also shielded from extreme temperatures by

added insulation. I never felt cold in my sleeper, or when walking about, or in the lavatories. Many parts of the train are exposed, however: The steel, fabrics, rubber, and bolts used in the air suspension systems were tested at temperatures below minus 49 Fahrenheit.

Thunderstorms cover the Tibetan Plateau for almost three months of the year, on average. Together with frequent sand and snow storms, lightning strikes may interfere with electrical and communications systems. A generator car takes up the rear of each train. Electricity is supplied by twin diesel units with a combined rating of about 2,144 hp at sea level.

The railroad spent less than \$500 million on rolling stock, with the majority of the project cost going into infrastructure. More than 80 percent of the track is above 13,000 feet. In contrast, Union Pacific's famed Tennessee Pass route in Colorado, the highest main line extant in North America, tops out at 10,221 feet. There are 675 bridges with a combined length of almost 100 miles. The Kunlun Mountains were another formidable obstacle — the so-called "backbone of Asia" that



This altimeter did not display the correct altitude for Tanggula Pass, 5,072 meters or 16,640 feet. Two photos, Albert Tay

had kept most invaders at bay for millennia and helped to preserve Tibet's isolation.

Skeptics said this railroad couldn't be built, but the nation that built the Great Wall was determined to prove them wrong, and it broke a few records in the process.

At an elevation of 16,627 feet, the Tanggula station eclipses the previous record holder, Bolivia's Condor station on the Rio Mulatos-Potosí line, at 15,700 feet, and tops Colorado's Pikes Peak cog railroad at 14,100 feet. At 16,093 feet, the 4,390-foot-long Fenghuoshan Tunnel is the highest railroad tunnel in the world. The Yangbajing tunnel measures 10,974



TIPS FOR TIBETAN RAIL TRAVEL

Arrangements for travel to Tibet must be made through a Chinese travel agency, most likely China Travel Service. Government approval for such travel is required and handled by that agency. Most travel is in groups that are handled on both ends by that travel agency. Travel by foreign individuals must be arranged in the same way; one has to have a designated party on the receiving end in Lhasa, with pre-arranged accommodations and exit-from-Tibet arrangements in place. U.S. passport-carrying citizens need to get a Chinese visa, which can be obtained for a fee by applying at Chinese consulates in major U.S. cities. Putting Tibet as the intended destination, however, complicates visa approval. The travel agency can be contacted in advance, but the visa application should be kept separate. Photography does not seem to be a problem as tourists are regularly seen taking pictures of historic sites.

— Bob Johnston

QINGHAI TIBET RAILWAY



feet and it's the longest tunnel on the line.

The extraordinary measures of the railroad's builders do not stop there. The line traverses the seismically active Kunlun region, which was

struck by an 8.1-magnitude earthquake in 2001. No wonder, then, that dozens of earthquake detectors have been installed along the track.

More than half the length of the railroad is laid on unstable

permafrost. Temperatures can plunge to minus 31 Fahrenheit in winter and then rise as high as the 90s in summer, turning tundra to mud. To minimize temperature fluctuations, special underground pipes of super-

An inbound passenger train enters Lhasa from the southeast on a grade-separated right-of-way on Sept. 5, 2011, under a powder-blue sky. Bob Johnston





Tibetans work one of many mustard fields along the track near Lhasa in June 2007. Two photos, Albert Tay

cold liquid nitrogen had to be installed. The measures are far from foolproof. Official media reports admit that the roadbed concrete in some sections has developed surface cracks and foundations have started sinking into the permafrost.

It took 100,000 workers five years to build those 710 extremely harsh miles from Golmud to Lhasa. According to the railroad's office, 40 of them died.

TROUBLE IN SHANGRI-LA

China's economic run and the charm offensive surrounding the Olympics have caused many people to forget that this is still a communist country.

But this is the regime that killed perhaps thousands of its own people in the 1989 Tiananmen massacre, and it invaded Tibet in 1950 while much of the western world's focus was on the Korean peninsula, containing communism there.

British novelist James Hilton set his novel "Lost Horizon" in a mythical Himalayan paradise that he called Shangri-La. The name stuck, and it has come to represent Tibet in many people's minds. For centuries, Chinese pilgrims traveled by caravan to "Western Heaven," Tibet, in search of Buddhist wisdom. Many emperors since the Tang Dynasty in the seventh century

have nurtured plans to subjugate Shangri-La, but not until 14 centuries later did the communist regime fulfill the age-old dream.

The communists came to power in 1949 after a civil war. Chinese forces descended on Tibet the following year, using the pretext of reclaiming a "historical province." A failed uprising saw the deaths of thousands of Tibetans and the exile of the Dalai Lama in 1959.

To consolidate Beijing's control over Tibet, Chinese ruler "Chairman" Mao Zedong sought a railroad to Lhasa. The plans remained dormant until 1978, but the section from Xining to Golmud became operational in 1984. It took another 16 years before work on the last and toughest stretch to the Tibetan capital was started.

The Golmud-Lhasa section of the Tibetan railroad has been likened to a second invasion by Beijing. Last year, more than 4 million people, including foreign tourists and Chinese from other provinces, visited Tibet. Analysts have pointed to the thousands of Han, or ethnic Chinese, who have grabbed the majority of business and employment opportunities. Anecdotally, all the cab drivers I met in Lhasa were Han.

Despite the advent of new

The Lhasa Express nears Namtso Lake in northern Tibet, near the end of the 1,225-mile line from Xining, in June 2007.

communication modes, getting an accurate picture of the situation in Tibet is a challenge. China routinely censors all forms of media and also blocks the country's access to websites the government deems inappropriate. A 2014 survey of 180 countries by Reporters Without Borders ranked China among the bottom five in terms of press freedom, just above Syria, Somalia, and North Korea. One can only imagine what life must be like for average Tibetans if the Chinese occupiers have such limited freedom of expression themselves.

Tibetan students are required to learn Mandarin, the language of officialdom and commerce, and it is a felony to own or display an image of the Dalai Lama.

There are of course supporters for the rail project. Chinese state-owned enterprises, local corporations, and foreign multinationals have had a major share in the pie. Some Tibetan companies have also benefited from the influx of capital. Anyone with anything to sell to visitors has reported brisk business, in everything from beer to concoctions for treating altitude sickness.

THE HIGHEST TRAIN YOU CAN RIDE: XINING TO LHASA

FROM THE DAY of the Qinghai Tibet Railway's opening in 2006, the Chinese government had lauded the overwhelming success of the line, propaganda echoed by travel agent bulletins urging would-be travelers to book early. In reality, however, demand fell well short of supply, as I discovered when management cut the Shanghai-Lhasa train's frequency from daily to alternate days, delaying my departure by 24 hours. Even on this schedule the train never filled to capacity.

And so it came to pass that on June 18, 2007, my two traveling companions and I taxied to Shanghai's central station to board train T-164, bound for Lhasa. At 7:30 p.m., the boarding call came for the 8 p.m. departure to Lhasa and intermediate points.

At the platform, the train comprised 13 dark-blue-and-yellow cars, all sparkling clean, and crew, wearing navy blue suits and ties, made a promising first impression. That was reinforced upon boarding and finding our compartment, a four berth "soft sleeper" with a high ceiling and plenty of pillows. It even boasted a real flower, not plastic, on the window ledge. The three of us had bought out the fourth space in the compartment for \$160 apiece — an extra \$40 well spent.

The dining car, adjacent to our sleeper, was staffed with a gaggle of cooks, but offered no dinner. Their advice: return for breakfast. Thankfully, I had come fortified with a stock of that marvelous, portable, lightweight, filling staple, "Cup Noodles." For this, I needed only boiling water, constantly available at the end of the sleeping car.

From first light until we left the valley of the Wei River in the afternoon, the contrasting array of rural and industrial China and its people passed before the window. In places, the ride reminded me of the famous Pennsylvania Railroad main line between Baltimore, Md., and Newark, N.J., in the 1950s.

In late afternoon, our train crossed the 125-mile stretch between the Wei River and Yellow River near Lanzhou, a city some describe as the most polluted place on the most noxious river on earth. Lanzhou had railroad shops and steel mills, including one mill with a working steam engine (and a flock of dead ones). Leaving behind Lanzhou, the catenary, and the so-called "Silk Road" main line to points west, we climbed 2,500 feet in 135 miles and 3 hours to Xining. There, the railroad to Tibet truly began. Leaving Shanghai we had seen many passengers in traditional Muslim garb, but most had gotten off by Xining. Now, for the first time, significant numbers of Tibetans boarded, filling the coaches.

Leaving Xining as darkness fell, I saw in the distance a hotel beckoning travelers with a glowing, multi-story neon beacon in the shape of the Eiffel Tower. A fitting farewell, as it turned out, to the China we had seen since Shanghai.

We awoke at 8,800 feet near Golmud, a different sort of China altogether, as witness the blazing morning sun in the crystal blue sky, the first we had seen of either for 10 days. On our arrival in Golmud, a flurry of activity ensued. The specially designed high-altitude General Electric diesels replaced the earlier motive power and a new crew, much younger than its predecessor, assembled in ranks on the platform and then snapped to its duties without hesitation.

Leaving Golmud, the serious climbing began, and our progression was observable on altimeters mounted near the vestibules. From 8,800 feet at Golmud the train rose to Kunlunshan Pass at 15,600 feet. This climb presented the first real test of passengers' ability to withstand altitude and the non-pressurized equipment's capacity to sustain them at more than 15,000 feet in elevation.

Nevertheless, sustained by my faith in Cup Noodles and peanut butter, and some experience skiing at 10,000 feet, I had decided to chance it. Passengers relied on the train's undercarriage-mounted gear that pumped 23-percent oxygen into the passenger compartments, and 40 percent through special outlets. It worked as advertised, for aside



On Sept. 4, 2011, passengers climb aboard a "soft sleeper" on the Lhasa-bound train at Xining, the last major stop in China before the long climb. Bob Johnston

from some mild discomfort when walking in the corridor, none of us had difficulty despite 12 hours traveling above 13,000 feet.

Climbing to the pass, the train reached the snow line at about 13,000 feet, but emerged from the tunnel into the almost snow-free landscape of a rolling plateau framed by massive mountain peaks on the horizon. The right-of-way became a gentle roller coaster across the high plateau as the train crossed a succession of streams.

On the adjacent highway an intermittent flow of trucks, civilian and military, lumbered along the rough surface, sucking at the thin air and belching exhaust. Here and there a roadside service area appeared, looking much like an all-purpose café-gas station-motel establishment found along the Alaska Highway about 25 years ago. Aside from the town of Nagu, 186 miles north of Lhasa, only a few small settlements appeared. Near these, as with most buildings in rural Tibet, were the traditional prayer flags representing the "Five Pure Lights" — blue for the sky, white for the air and wind, red for fire, green for water, yellow for the earth.

Except for the occasional solitary railroad worker snapping to attention and saluting, people along the right-of-way paid little obvious attention to the train passing through this overpowering landscape. Encountering the Alaska pipeline while driving cross country some years before I had understood the soothing (but possibly delusional) observation that the pipeline had no more impact on the wilderness than "a thread stretched across a deep pile carpet." Similarly, in this vastness, the train, its tracks, the bridges and grids, and refrigeration pumps designed to protect the permafrost that underlies more than half the route might seem to passersby like Lilliputian trinkets from Brobdingnag in Jonathan Swift's classic tale "Gulliver's Travels."

This notion grew more credible as the train climbed through Fenghuoshan Tunnel, the world's highest rail tunnel, to Tanggula Pass, the world's highest rail line. After Fenghuoshan, the train resumes its undulating course from streambed to streambed until Yangbajing, just 51 miles from Lhasa, where the descent begins into the Lhasa River and into Lhasa station, a mere 12,000 feet in elevation. In the Lhasa station, a brigade of police shuffled the passengers into the station without an opportunity for photographs.

Walking through the massive station to the waiting van, I found myself gasping for breath more than I ever had on the train itself. This provoked thoughts for the thousands of workers who toiled for years to dig tunnels, erect bridges, and lay rails on the stunning route. For their sake, indeed for all of us, I wished that the sentiments imbedded in the five prayer flags — increase life, fortune, health, and wealth for all sentient beings — may prevail. — Harold C. Livesay, a professor of history at Texas A&M University



A conductor walks briskly at Nagu in September 2011. There, passengers sample the rarefied air at one of the few intermediate stops on the line to Tibet. Two photos, Bob Johnston

THE GOING GETS TOUGH

Many journalists mistakenly suggest that cars on the Lhasa trains are pressurized like commercial airliners. In fact, cars and gangway connections are sealed, not pressurized, when all doors and windows are fully shut. Each car has individual, fully redundant air-delivery systems that supply oxygen-enriched air. I had the feeling that the cars were not well sealed, and then I found that a few small windows were open, especially in the bathrooms. More than a handful of passengers felt woozy as the train reached the Tibetan Plateau. A couple of my compartment mates had little opportunity to

look out the window. They were lying down much of the time. I was thankful not to feel any of the symptoms of altitude sickness. A benefit of non-pressurization was partial acclimatization, which would not be experienced by those arriving at Lhasa by air. The downside was that some laptops, digital media players, and other devices with hard drives reportedly crashed due to the thin air.

Andy Goodman, a teacher from Panama City, Fla., was nursing a splitting headache. The fact that he had been drinking before he got on board did not help. But he managed to gush about the gorgeous scenery. By the second day, though, he declared that he'd seen enough mountains for one lifetime. He had come to enjoy my company and my services as his personal interpreter, so he was crestfallen when he found out we would not return together.

Our approach to the Tanggula Pass was announced. I checked the nearest altimeter at this, the summit of our journey. It was indicating way below the actual 16,640 feet. I asked one of the staff and she sheepishly said that it must be faulty. Another inaccuracy was the top speed. Although "160km/h" (99 mph) was emblazoned on the sides of the carriages, I never saw any speed above 80 on the information display. The panel did show that it was 5 degrees Celsius, or 41 degrees Fahrenheit. I asked, "And this is summer?"

The beauty of traveling on the Beijing-Lhasa Express is that you can truly relish the journey and anticipate the destination. The summer scenery as we crossed the border into Tibet was easily the highlight: stunning mountain peaks, ice and snow, lakes, and the incredible expanse of space. The sky's blues and whites looked

especially vivid due to the clear, thin air. The land literally takes one's breath away.

The landscape was dotted by yaks, goats, and sheep, but I had my eyes peeled for rarer animals like the Tibetan antelope. Environmental groups had warned that the habitat of this endangered species might be severely degraded by the railroad. To be fair, the Chinese government did take some measures to reduce the brunt that had to be borne by wildlife.



Oxygen outlets are provided beside seats in the passenger cars, which are unpressurized.



A view inside one of the four “hard seat” coaches on the author’s train, which are the most affordable and typically used by Tibetans. Two photos, Albert Tay



Forty-seven hours later, the Lhasa Express pulls into its namesake city with three diesels, having traveled 2,332 miles from Beijing, roughly the driving distance between Jacksonville, Fla., and Los Angeles.

For example, 33 passageways have been built under the track at various points to allow animals some movement. Critics have ridiculed the small number of underpasses, while wildlife experts doubt that they would be much used. Fences have also been erected to minimize the number of wildlife and livestock wandering onto the track. So it was a delight and relief to see the antelope grazing nonchalantly as we trundled passed. I was surprised that one didn't bat an eyelid even though it was just some 20 yards away from our train. It seemed underwhelmed by the supposedly heroic rail line.

The long-term ecological impact of the railroad is still unknown. Much will depend on how much economic activity, like mineral exploitation and ecotourism, is made possible by the railroad. What can't be denied is that previously pristine

territory has been scarred by a track requiring extreme efforts to build and maintain. No matter how you spin it, having underground pipes of liquid nitrogen can't be good for sensitive habitats on marshlands and tundra.

The basic “soft sleeper”—four berths to a room—costs \$158 per person from Beijing to Lhasa. “Hard sleepers” are more Spartan, accommodate six to a room, and go for \$102. Such prices are low by international standards, but as of 2015, the average annual private sector salary in China is about \$4,515.

A CONNECTION

Coming from a densely populated city, I could barely comprehend the isolation that wandering herdsmen must feel. They probably don't feel seclud-

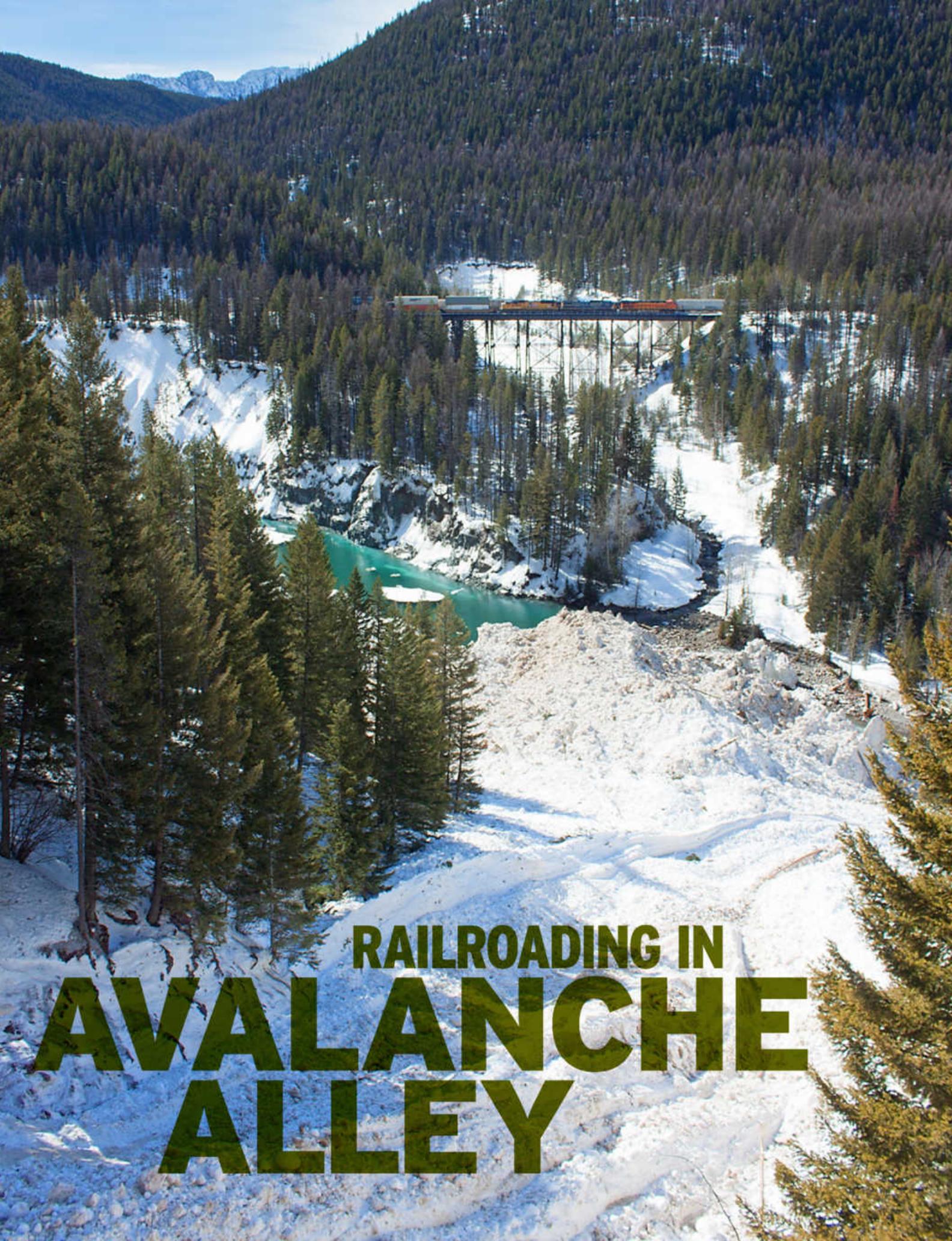
ed or that seclusion is anything unusual. Some 3 million Tibetans live on a plateau that's four times the size of Texas. Flocks, tents, and towns were not surprisingly few and far between. Even rarer was the glimpse of faces, and when they were seen, they were weather beaten. In addition to the difficult environment, the people have had to live under occupation. Their land has also taken a beating from the latest stretch of the railroad. I couldn't help but have sympathy—as well immense admiration and respect—for Tibetans.

The journey from Beijing to Lhasa is roughly the driving distance between New York and Los Angeles. After 47 hours, we finally pulled into Lhasa. Though not quite the Venice-Simplon Orient Express in terms of comfort, the service on

our train was excellent by Chinese standards. It certainly made going to Shangri-La less businesslike than arriving by air.

Suitably chastised by the whole experience, I've resolved not to go there until it regains real autonomy. Since the Chinese communists have learned survival lessons from the collapse of the Soviet Union, that'll probably be decades later at the very least. A few previous dynasties lasted centuries. I'm sure I'll not recognize the Roof of the World if I do get to return. There has been so much change already in a short time. But like the thousands of Tibetans in exile, I'll never forget the blue skies and white clouds. Never. **I**

Of Chinese descent, **ALBERT TAY** is a frequent traveler, based in Singapore.



RAILROADING IN **AVALANCHE ALLEY**

COVER STORY



At left, a BNSF train crosses the Goat Lick Trestle near Essex, Mont., on March 8, 2014, a few days after an avalanche blocked the river below.
Above, "snow dozers" await action in Essex in 2012. Two photos, Justin Franz

For 12 hours, heavy, wet snow had been falling in John F. Stevens Canyon, near Essex, Mont. Finally, late on the night of March 2, 2014, the weight of the new snowfall became too much for its supporting base. In a matter of seconds, a mass of snow and ice was cascading thousands of feet down the side of a mountain, picking up anything in its path.

Not long after the avalanche crashed to a halt, a BNSF Railway employee driving a piece of maintenance-of-way equipment came around a corner on the railroad's Marias Pass line and was confronted by a 7-foot wall of snow, ice, and trees. BNSF's main line to the Pacific Northwest was closed.

As unsettling as the sight might have been, it did not come as a complete surprise. Managers, dispatchers, and maintenance-of-way workers were informed hours earlier that avalanches were about to come crashing down the side of the canyon thanks to Ted Steiner, an avalanche safety specialist contracted by BNSF every winter. From November to April, Steiner and a small team of experts based out of Essex are tasked with keeping BNSF's main line across northwest Montana safe in an area railroaders call "Avalanche Alley."

BNSF's avalanche program is not alone — the Alaska Railroad has actively battled avalanches since the 1980s — but it is unique in that it is one of the few in the

country that cannot mitigate the threat because of its proximity to a national park. Because of that, the challenges facing BNSF employees in the 21st century are not unlike the ones faced by railroaders more than 100 years ago, in the era after John F. Stevens found Marias Pass.

SEARCHING FOR AND CONQUERING MARIAS PASS

Twenty years after the Union Pacific and the Central Pacific met at Promontory Point, Utah, in 1869, James J. Hill was building his own transcontinental railroad across the west. Hill, a Canadian-born businessman who settled in St. Paul, Minn., was far from first when it came to building an iron road to the Pacific Ocean, but he was confident he could build a better, more direct route than his predecessors. To do so, however, he needed to find Marias Pass, a mysterious passage known only by natives that had never been seen by white settlers. The pass is among the lowest crossings of the continental divide at 5,213 feet above sea level. (The Union Pacific, for example, crosses the divide in Wyoming at an elevation of more than 8,000 feet, and the Denver & Rio Grande Western's legendary crossing of Tennessee Pass in Colorado is at more than 10,000 feet.) Marias Pass' lower elevation does not mean a more forgiving climate: It sees an annual average snowfall of nearly 270 inches.

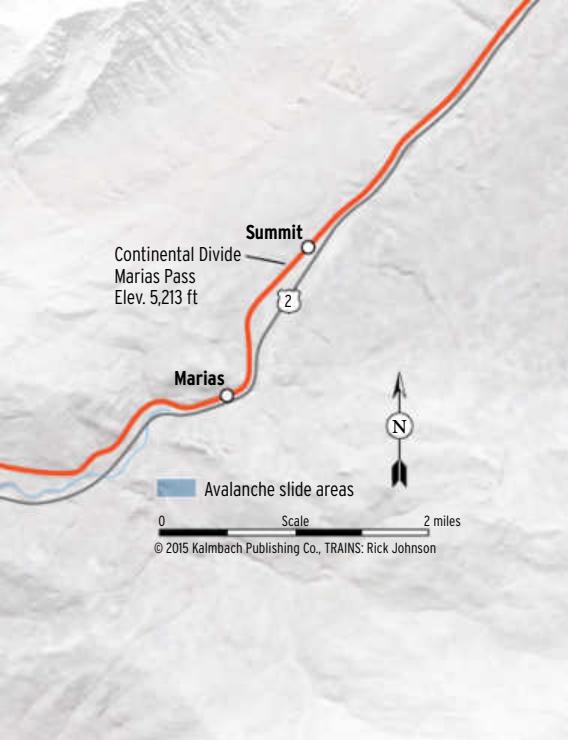
Interestingly, the first transcontinental railroad could have been routed over Marias Pass had it not been for a Secretary of War with southern sympathies. In 1853, Congress appropriated \$150,000 to the War Department to survey four rail routes west. Isaac I. Stevens, a former U.S. Army Engineering Corps major and governor of the Washington Territory, led the effort to plot a northern route and sent engineer James Doty into the wild to find the long-sought Marias Pass. In spring 1854, Doty and a local guide explored the area around today's Glacier National Park and eventually found a 15-mile-wide gap in the mountains. Doty enthusiastically believed he had found the eastern slope of Marias and sent word to Stevens. But that enthusiasm was quickly deflated when Stevens told Doty that Secretary of War Jefferson Davis (who later became president of the Confederate States of America) preferred a southern transcontinental route and demanded that they stop looking for Marias Pass.

Nearly 35 years later, Hill was looking to expand his ever-growing Great Northern Railway west over the mountains and sent John F. Stevens (no relation to Isaac I. Stevens) to find the best route. Plotting mountain railroads was a familiar task for the 36-year-old, who had previously helped engineer the Canadian Pacific and the D&RGW's legendary narrow gauge route. In December 1889, Stevens and a native

MEN, MACHINES, AND SCIENCE BATTLE THE ELEMENTS TO KEEP BNSF RAILWAY'S MARIAS PASS ROUTE OPEN ▪ BY JUSTIN FRANZ

BNSF'S MARIAS PASS: THE WAY THROUGH AVALANCHE ALLEY





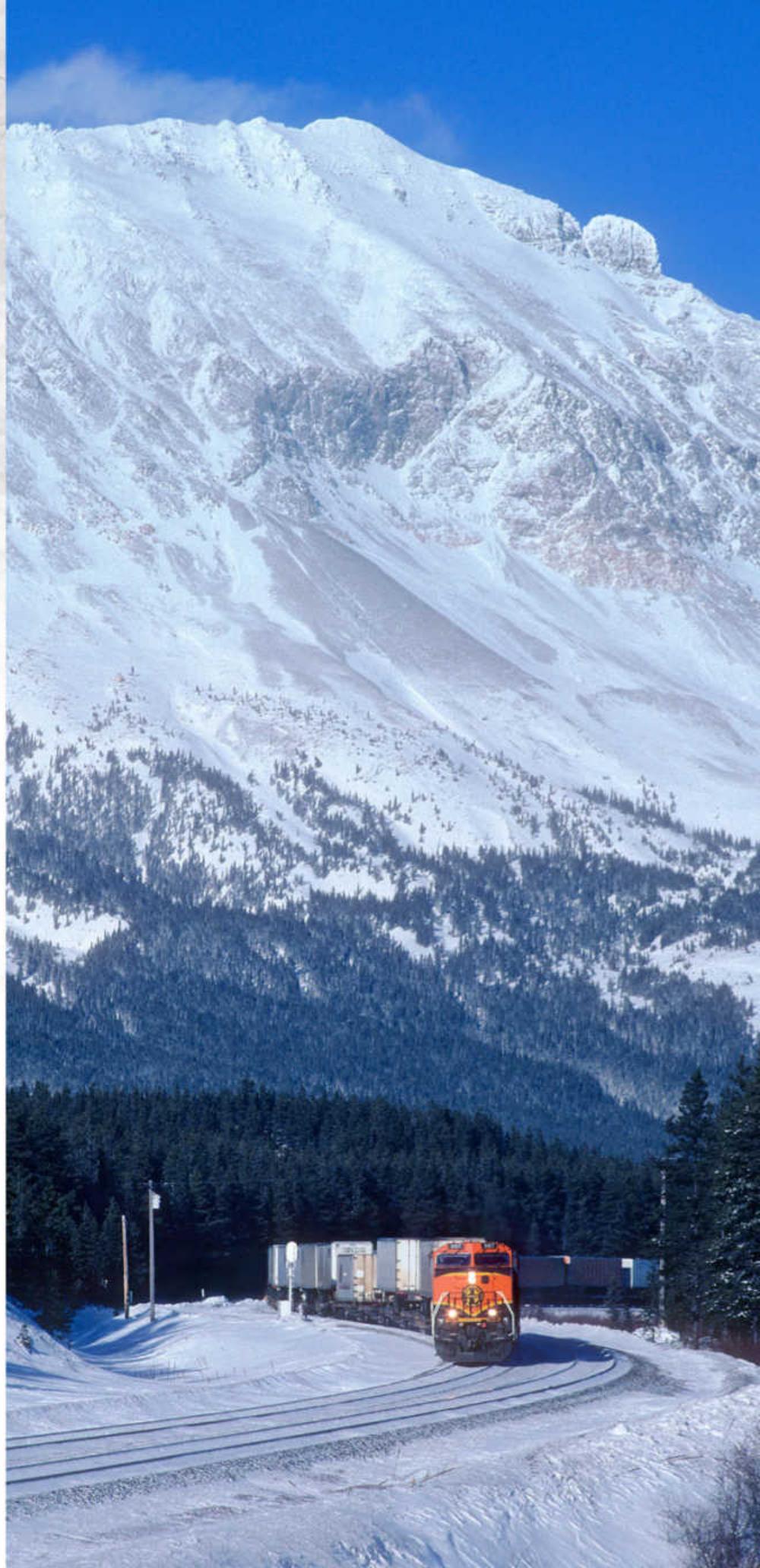
reported that the tips of his fingers were worn off from “clawing in the snow and dirt trying to effect his release.”

To protect the railroad from avalanches, snow sheds were built along many of the slide-prone areas on Marias Pass. However, even those could not protect everyone, as a poor 17-year-old watchman found out in 1917 in what the Whitefish (Mont.) Pilot called “one of the most terrible deaths ever recorded in Flathead County.” According to the paper, young John Sembratt was hired to watch the tracks and was sitting in a small cabin early on the morning of March 29 when a slide rolled down the mountain. It was thought the boy was seated next to the stove when the slide hit; when rescuers found his body beneath 20 feet of mud, snow, trees, and rocks, it was burned beyond recognition.

Although it is almost impossible to get an exact count, more than a dozen railroaders are believed to have been killed in avalanches on Marias Pass between the 1890s and 1930s. That death toll pales in comparison to one further west on the GN, near Wellington, Wash., site of the deadliest avalanche in North American history.

In late February 1910, two GN trains were stranded in the Cascade Mountains by a blizzard that created impenetrable drifts. On Feb. 28, the snow turned to rain, and thunder and lightning pounded the area through the night until the mountains gave way on March 1 at 1:42 a.m. An avalanche came sweeping down Windy Mountain and sent the two trains and the Wellington station down a 150-foot gorge. The trains were buried in 40 to 70 feet of snow.

Charles Andrews, a GN employee who witnessed the calamity, gave the most





Avalanche forecaster Ted Steiner. Below, an eastbound freight is at Java, where the avalanche area begins. Two photos, Justin Franz

haunting description: "White Death moving down the mountainside above the trains. Relentlessly it advanced, exploding, roaring, rumbling, grinding, snapping — a crescendo of sound that might have been the crashing of ten thousand freight trains. It descended to the ledge where the side tracks lay, picked up cars and equipment as though they were so many snow-draped toys, and swallowing them up, disappeared like a white, broad monster into the ravine below."

Ninety-six people perished in the avalanche that led to the railroad constructing a newer, longer Cascade Tunnel to avoid the dangerous slopes near Wellington.

FORECASTING IN AVALANCHE ALLEY

Nearly a century later, the GN's successor, BNSF Railway, is still battling avalanches, especially in the mountains of Northwest Montana, near Glacier National Park.

On Jan. 28, 2004, an eastbound empty

grain train was struck by an avalanche about 7 miles east of Essex. After the train came to a stop, it was hit again by another avalanche, derailing a total of 15 cars.

Later, railroad workers from Whitefish were inspecting the train. After walking along the uphill side of the train, the workers came around and were walking along the south side when the covered hoppers shook. A second avalanche had come down the slide path of the first one, at a spot where the workers had been standing just minutes earlier. "Had they been there on the other side, they would have gotten piled up against that train," said Steiner, BNSF's avalanche consultant.

Railroad officials quickly realized how unstable the situation was and called David Hamre, who directs the Alaska Railroad's avalanche program. [See "Avalanches in Alaska," page 44.] Hamre spent a few days in northwest Montana, creating an avalanche atlas of the area and recommending that the railroad create a permanent forecast program. The next year, BNSF signed a contract with Hamre's avalanche consulting company to operate a forecasting program out of Essex and hired Steiner, who was working at the Glacier Avalanche Center, to lead it.

The program focuses on 4 miles of railroad just east of BNSF's Java Creek Trestle, although Steiner will frequently observe slide activity beyond those parameters to get an idea of area conditions. Within that 4 miles are 12 major avalanche paths, 26 different starting zones and eight snow sheds

(a ninth, near Essex, is just outside the forecast area). Avalanches run down the canyon almost every winter, but only hit the right-of-way every few years. Since the avalanche program began, slides have affected the right-of-way in 2009, 2011, and 2014.

Steiner's work usually starts in November, when he spends a few weeks inspecting and maintaining the railroad's weather stations that are located throughout the canyon. He also puts on avalanche education courses for railroad employees that work in the Essex area, mostly maintenance-of-way workers and train crews. The focus of the day-long classes is safety; employees get a crash course on how avalanches work, how to reduce their exposure to avalanche-prone areas while at work or play, and how to use a transceiver. An avalanche transceiver is basically a beeping beacon that can aid in a rescue. Most maintenance-of-way employees who work in "Avalanche Alley" are outfitted with slide safety gear.

Once winter hits, Steiner and some of his associates — one of them, Mark Dundas, has worked with the program for a decade — go into the field once or twice a week to make avalanche forecasts. Most of the time, they traverse the back country on snowshoes or skis. Once they find a slope they can safely inspect, they dig columns in the snow to inspect the snowpack profile and gather data about the current conditions. The columns, or snow pits, allow forecasters to see the various layers of snow and ice (like a birthday cake, snow piles up





On Christmas Day in 2007, Amtrak's eastbound *Empire Builder* makes its station stop in Essex, Mont., as a stack train waits on the westbound main and a ballast regulator equipped for snow removal waits for a light-engine move on the yard lead. Mike Danneman



To create avalanche forecasts, Ted Steiner and his associates hike, ski, or snowshoe onto the slopes above BNSF's line over Marias Pass to examine the area's snowfall. At right, Mark Dundas uses a shovel to perform a compression test, finding out how much pressure the layers of snow can withstand before collapsing, which helps determine how likely the snow is to slide. Two photos, BNSF Railway

AVALANCHES IN ALASKA



An Alaska Railroad coal train pushes through drifts at Brookman en route to Seward in 2014. The railroad battles avalanches between Anchorage and Seward. Frank Keller

Avalanches are a force of nature the Alaska Railroad has had to face since its construction. From 1917 to the 1970s, there were nearly a dozen instances where an Alaska train derailed in a slide. In January 1980, a freight train struck an avalanche and derailed in the Chugach Mountains, not far from Anchorage. During the cleanup, more slides came down and the harrowing event convinced railroad officials it needed to mitigate the problem. Since then, the Alaska has had one of the world's most active railroad avalanche forecast and prevention programs, headed by Program Director David Hamre, who has been with the railroad since 1981.

Most of the Alaska's avalanche issues occur on the line between Anchorage and Seward. Hamre said there are 50 to 100 avalanches along the rail line every winter, but only five or 10 actually impact the right-of-way. To ensure that doesn't happen, Hamre and his colleagues will use artillery to trigger smaller, more manageable slides. "The ideal situation is that we intervene when there is just enough snow to slide but not enough snow that it'll get big and hit the tracks," he said. "If we get 2 feet of snow in one storm, we're out there shooting."

The railroad has also installed advanced warning technology along sections of railroad so that dispatchers in Anchorage know if a slide has come down. Seismic sensors located in traditional avalanche starting zones trigger an alarm on the radio that a slide has started and highly focused radio beams near the tracks can tell officials if the slide has hit the right-of-way. "We're using a lot of technology these days," Hamre said, adding that a dispatcher can know within three seconds that a slide has started moving toward the tracks. "You can't make good decisions without good information." — Justin Franz



in layers; depending on how much water is in the snow or the temperature when it falls, some layers are stronger than others), and perform extended column and compression tests. The simplest way to do a compression test is apply pressure to the top of the snow with a shovel or a pair of skis. Eventually, the snow will fall, revealing the weakest layer. The easier it is to make that layer of snow fall, the more likely it is that a large-scale avalanche will occur. (An extended column test differs in that forecasters isolate the snow column using poles and a rope to cut around it. It is more complex than a traditional compression test but often offers better information.) Steiner says he also pays attention to how the snow reacts under the weight of his own skis when traveling in the back country.

Once Steiner gets back to his office in Essex, he combines his field observations with weather forecasts and other slide reports from around the area to come up with an avalanche forecast. That forecast is then sent to various railroad officials in the area. "We do the best we can to get the best information on conditions," he said. "We are constantly communicating with the roadmaster, management, and maintenance-of-way people and letting them know what we're seeing out there."

The forecast also comes with recommended restrictions, which on rare occasions even suggests halting rail traffic. Since the program began in 2005, Steiner has only recommended a track closure on three occasions, once in 2006 and twice in 2014. Steiner said he will only recommend

closures in extreme situations and only with objective data gathered in the field and from weather forecasts.

That is the type of scenario that unfolded during the first week of March 2014, when the main line across Marias Pass was closed twice in just four days. The first slide, on March 2, halted freight traffic for at least 12 hours, until the railroad was able to use a plow to clear one of the mainline tracks. Meanwhile, passengers aboard Amtrak's *Empire Builder* were bused around the avalanches until the issue had subsided.

But just a few days later, three more massive avalanches came ripping down the canyon, including one that went right over one of the railroad's snow sheds. Another slide was so large it temporarily blocked the Middle Fork of the Flathead River. Be-



cause of the impending danger, the railroad was shut down again. After the second closure, BNSF applied for an emergency special-use permit from Glacier National Park to conduct avalanche mitigation along the tracks using a "daisy bell" suspended from a helicopter. A daisy bell is a hydrogen combustion cylinder that fires pressure waves at the snowpack to trigger slides.

It was a rare instance where the National Park Service allowed the railroad to mitigate the threat. The park superintendent who approved the permit noted it was necessary because of the region's extreme winter. Just a few days earlier, an avalanche had destroyed a house in a residential area near Missoula, Mont., burying three people. The railroad sought to use explosives in the canyon a decade earlier to mitigate ava-

lanche threats, but the park service denied the proposal and said it would only approve mitigation efforts in extreme situations where human lives were in danger.

While 2014 was one of the most active avalanche seasons Steiner has seen in John F. Stevens Canyon, 2015 proved less dramatic. What little snow did fall in Northwest Montana melted early. But even during years avalanches don't impact the railroad, the information Steiner gathers doesn't go to waste. Much of it is given to the Flathead Avalanche Center that provides slide forecasts for area skiers and snowboarders who venture into the back country. Besides sharing data, BNSF also helps the local outdoor community financially, and in 2014 it donated \$5,000 for the installation of a state-of-the-art weather station at nearby White-

With the slopes of "Avalanche Alley" behind it, a westbound BNSF grain train follows the Middle Fork of the Flathead River near West Glacier, Mont. Justin Franz

fish Mountain Resort.

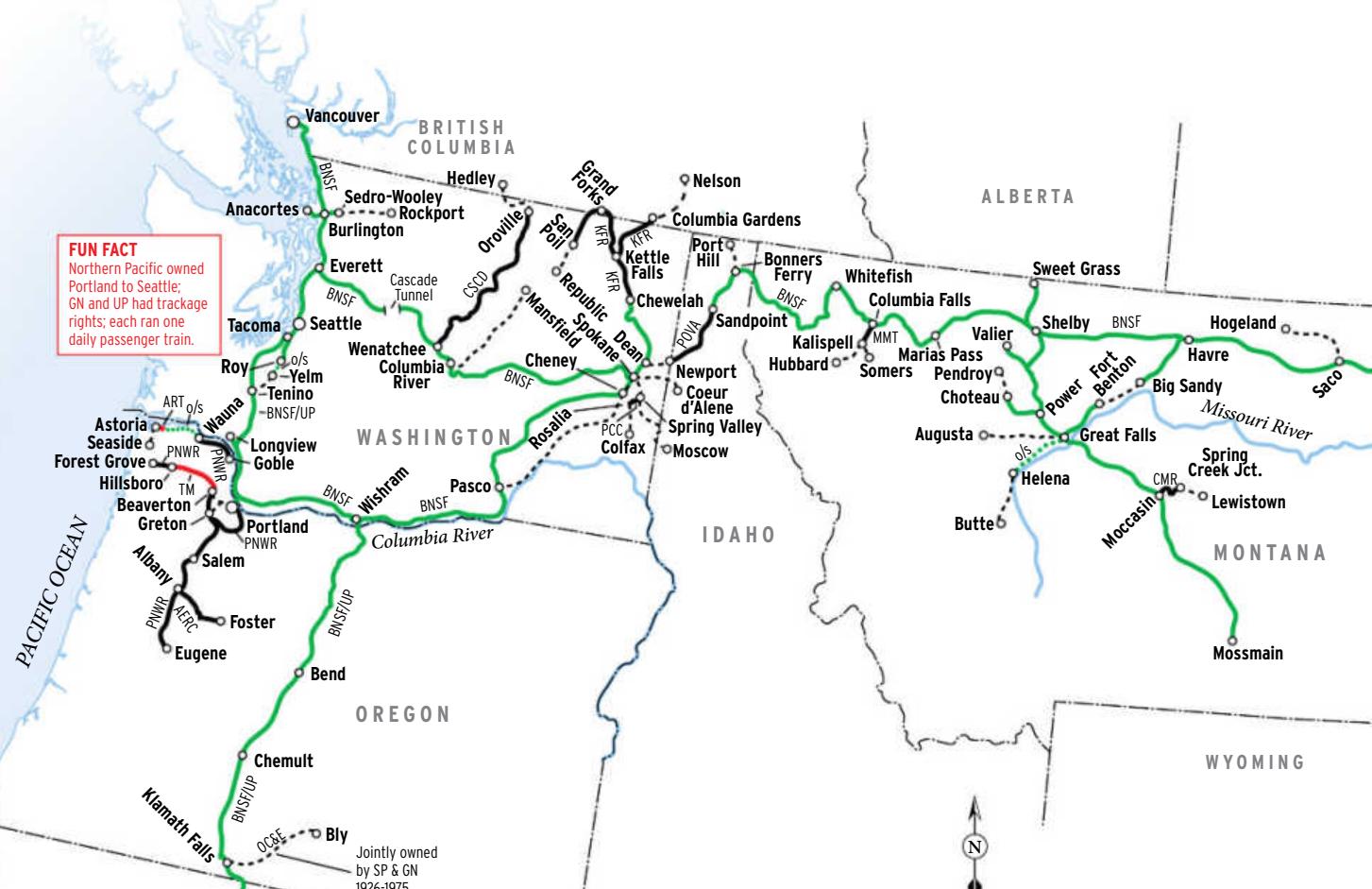
"We're very fortunate to have a railway in this community that is as focused on safety as BNSF is," Steiner said. "The railroad is top notch in this regard."

More than a century after James J. Hill sent men into the wilds of Montana to build a railroad that would tame the wilderness, railroaders are still finding that in these parts Mother Nature makes the rules, especially in a place called "Avalanche Alley." But despite the challenges of running trains up and over Marias Pass in winter, BNSF is using science and people like Ted Steiner to make it just a little bit safer. **I**

MAP OF THE MONTH

The Great Northern today

A look at what remains and what's been lost from James J. Hill's northern transcontinental route

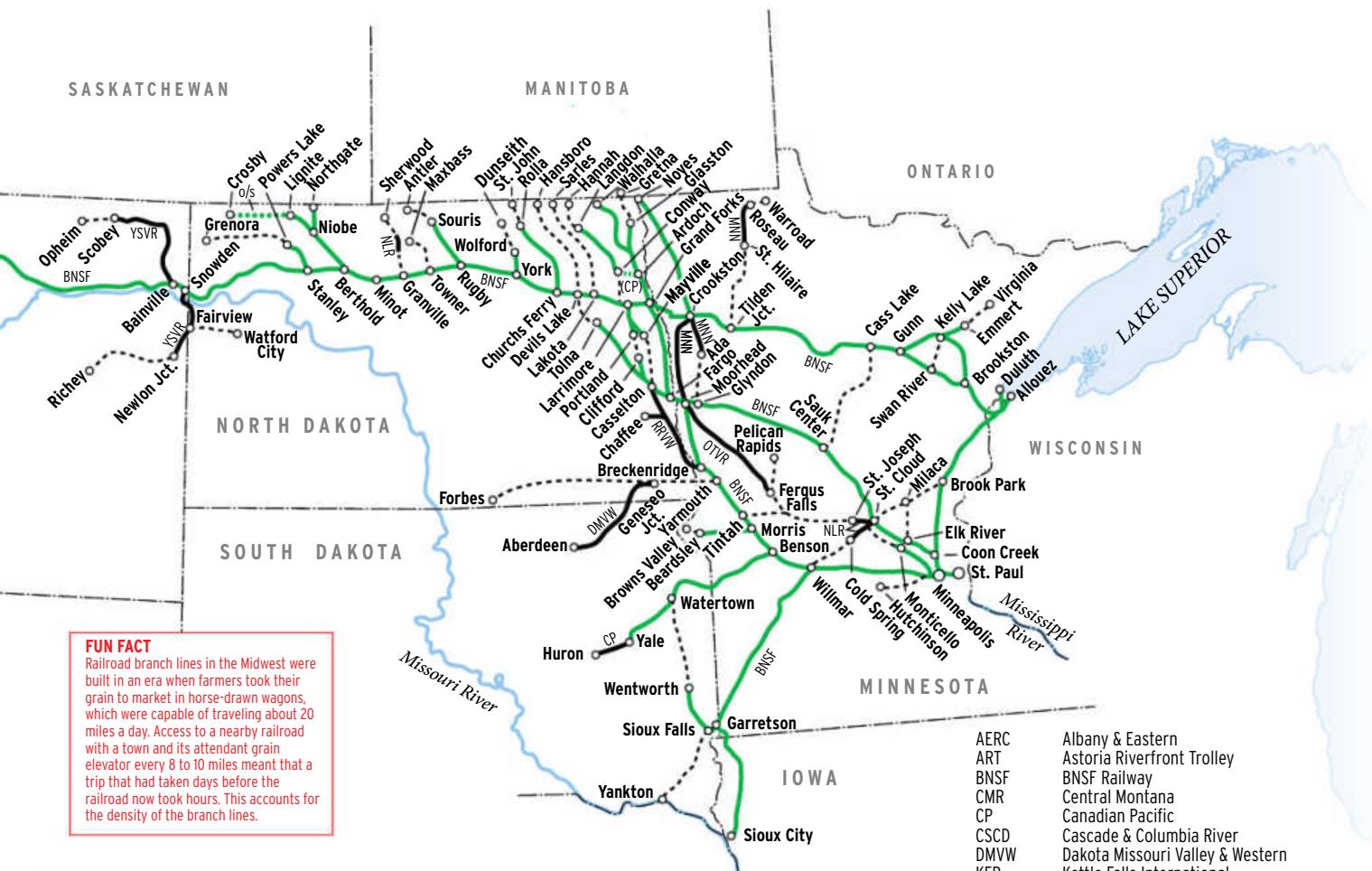


Great Northern and Spokane, Portland & Seattle 1956





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What's left of the Great Northern 2016



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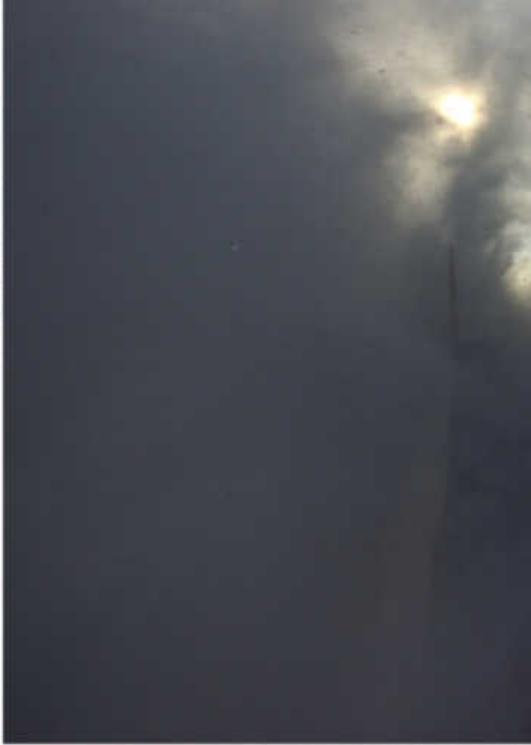
TER COMES

Snowplows cannot be far behind in Southern Ontario

Story and photos by Stephen C. Host



Near Sebringville, Ontario, on the Goderich Sub, a trio of Goderich-Exeter Geeps roll in the wake of snow kicked up by the plow on Jan. 25, 2015. In deference to Mother Nature's strong will, the consist offers 6,750 hp and a plow.



BITTER COLD, BLIZZARDS, AND BLOWING SNOW

Winter. It comes every year, and that means we have to shovel our driveways, de-ice our cars, and battle difficult conditions to get to work or school. Railways are no different. When they have freight or passengers to move, they have to clear the tracks. In Ontario, Canada, a pair of railways regularly use snowplows to keep their routes open. Let's ride along with the crews of the Goderich-Exeter Railway and the Ontario Southland Railway as they battle against winter.

The recipe for a railroad maintenance-of-way department to call a plow extra is quite simple: Recently fallen snow, bitterly cold temperatures, and wind, the combination of which blows snow from fields onto the right-of-way. Conventional snow removal techniques are fine for light snow, but when snow piles up, these two railroads face the fierce winter battle in Southern Ontario with railroading's ultimate weapon, the snowplow.

The equipment that is used for this service has a long history.

The Goderich-Exeter Railway's lone plow is older than the motive power that pushes it by a wide margin. Built by the Eastern Car Co. in 1938, GEXR 55413, a former Canadian National plow, has seen six generations of motive power push it over the years. Based out of Stratford, Ont., the plow, in a unique black paint scheme, sits most of the year until cold weather comes.

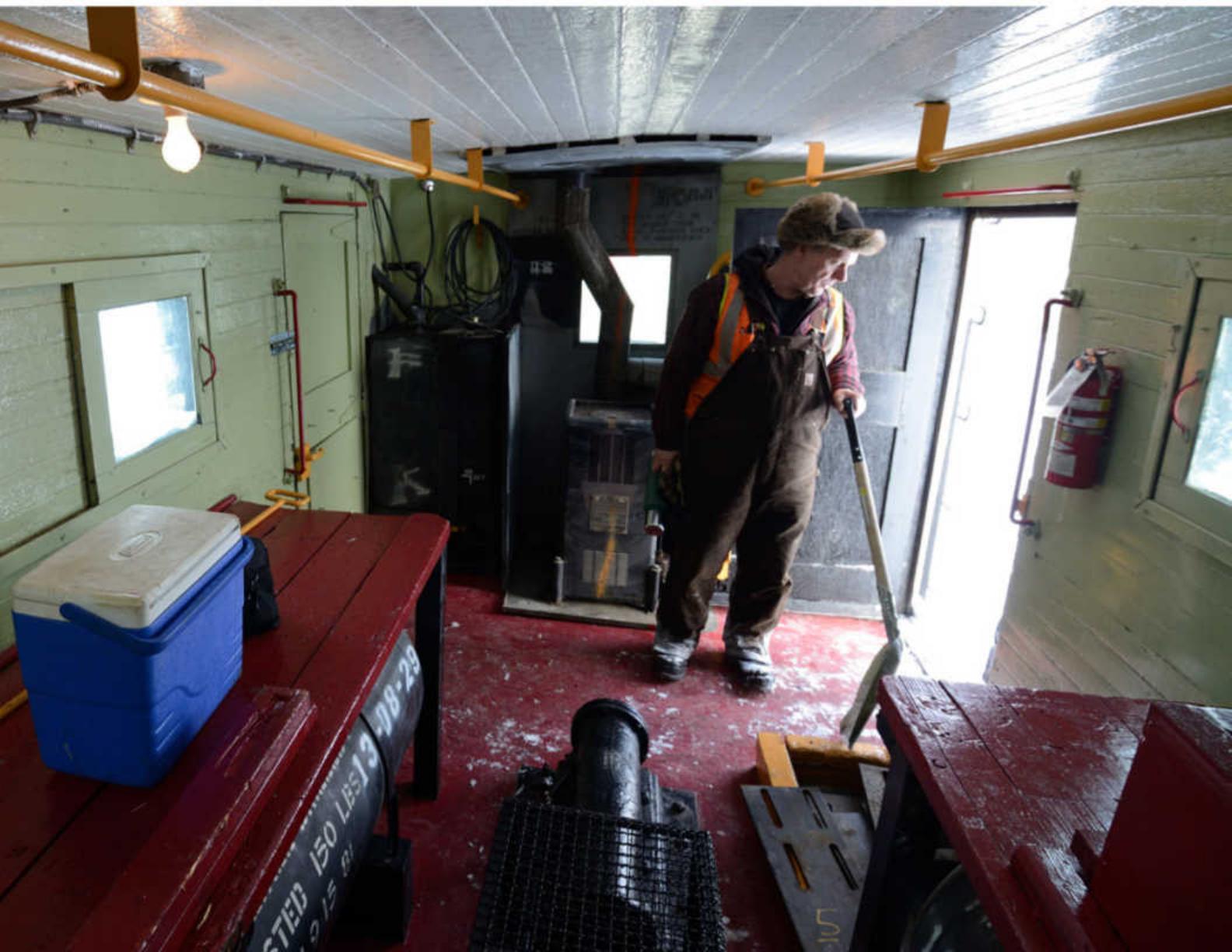
The plow has extra help. In 2014, Goderich-Exeter acquired a Kershaw snow removal machine to clear yards. The company also uses contractors with front-end loaders to clear lightly trafficked routes, such as the Exeter branch. Snow-bearing winds off Lake Huron have proven to be vicious and prolific over the last two years and No. 55413 has rescued the railway on many occasions where no other option would do.

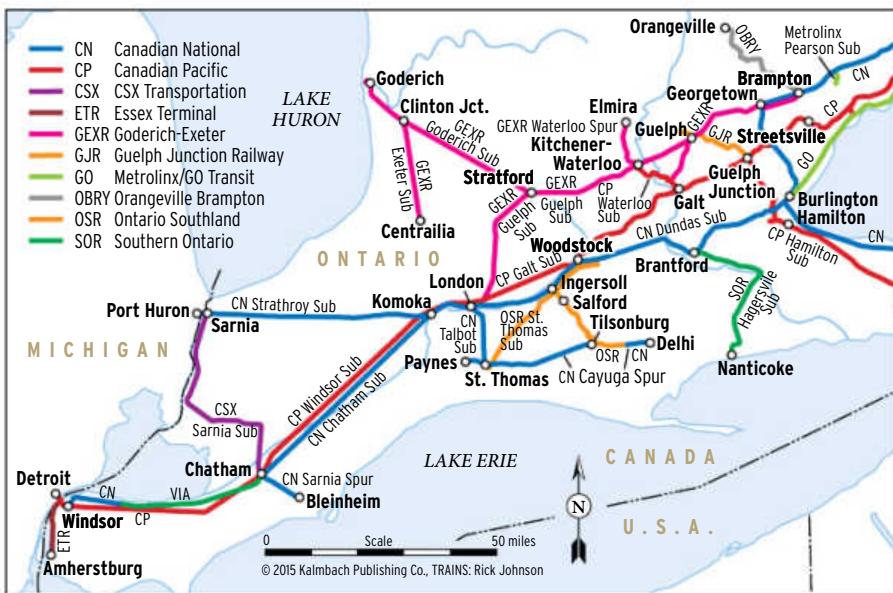
Not far away, Ontario Southland Railway, based out of Salford, Ont., on former Canadian Pacific Railway track, uses an even older plow: 108-year-old CP plow No. 401005. It is stationed on the railroad's Port Burwell and St. Thomas subdivisions. Built of wood as CP No. 400706 and rebuilt in September 1927 at Angus Shops as No. 401005, the plow moved from CP ownership to Ontario Southland in 2015. There it has seen good use in harsh conditions.





From behind the plow, one moment the sun shines brightly, wings are stretched out and acceleration begins on the line to Tillsonburg, Ont. Snow flies, darkness ensues, and nothing can be seen. Moments later, the sun gleams again. We're riding on Ontario Southland FP9 No. 1401 in February 2015. Below, foreman Jack Hyde has his shovel in hand during a break in clearing snow from sides and top of plow in February 2014.





Upon entering No. 401005, one is greeted with the pungent smell of fuel oil from a stove that is on full blast, keeping the plow nice and toasty warm. The other smells are coffee and doughnuts, both staples for hungry, tired, and cold crews in Canada on a frigid winter day. The interior looks unmistakably like a wooden CP caboose with green walls, red floors and benches, white ceilings, and tongue and groove siding all around. What is different is the presence of yellow grab bars everywhere. They are there for good reason.

Snowplows employ springless front trucks to ensure a good cut into the right-of-way. When there isn't much snow to plow, the plow is like riding a mechanical bull, bumping up and down. You hold on to something, trying hard not to spill your coffee. But when plowing, the ride becomes

smooth due to the downward force on the front trucks from the weight of tons of snow.

While a plow acts like a giant shovel, there are two main appliances: Seven flanger blades that act like knives, cutting into the ice and snow; and wings, stretched out to clear a few extra feet of right-of-way.

When on the road, the vantage point of the plow provides excellent visibility to what's coming toward you, but most of the action is to the rear. Plow crews are the eyes for the engineer and operate the plow appliances. Let's ride along with one plow crew in the winter of 2014.

On Ontario Southland, foreman Jack Hyde discusses with conductor and railroad Vice President Brad Jolliffe the difficulty of negotiating a large drift ahead. Without hesitation Brad radios to the locomotives a simple command: "heavy ahead on the plow."





Looking to the rear of the plow on the Ontario Southland near St. Thomas, Ont., one moment you see FP9 No. 6508, and the next you don't. Below, foreman Jack Hyde retracts the wings inside plow No. 401005. His vantage point is the cupola on top of the plow.



On Jan. 9, 2014, Goderich-Exeter foreman Jack Elliott has his hand on the horn and his 1938 plow westbound near St. Pauls Station on the Guelph Subdivision at 40 mph.





In acknowledgement, engineer Gary Dagelman notches up the engines, gaining additional speed to power through the drift. Once the drift is encountered, I feel the momentum of the train immediately slow down, yet the ride becomes steady and even. The plow throws snow in all directions alongside, creating a hissing sound that fills the air. The motive power behind us is no longer visible, lost in a sea of white. The train is still slowing, and Jack and Brad are worried about stalling. "More speed! More speed!" Brad urges Gary. If the train stalls in the drift, that would be it; we'd be stuck. The pair of EMD 567 engines growl louder as Gary responds to Brad's call. We're in the thick of the cut, but no longer losing speed. Seconds later the hissing stops and the sun is visible once more. The train suddenly gains a burst of speed: We're through the drift. Brad radios to the locomotive: "OK to stop on the plow." The train gradually comes to a controlled halt. We back up. The heavy cut warrants a second pass, and after reversing, we pass the drift one more time with the wings stretched out. This time, we are satisfied that the snow is indeed clear.

On one trip, after plowing to St. Thomas, we have an hour or so of relaxation as the head end takes over for the reverse move for 30 miles until we reach the junction for the Port Burwell sub at Ingersoll. Darkness has fallen by the time we arrive, taking the switch at Ingersoll with the plow in the lead. Jack throws down the blades and stretches the wings amidst a whoosh of pneumatic air and the thud of the wings spreading. The plow's headlamp beams down the right-of-way like a spotlight, illuminating the scene. The EMD engines growl as we accelerate, white stuff flying in all directions, and the blast of the horn warning motorists of the oncoming train, literally plowing into the darkness. It is a humbling experience. Four miles to the south, we arrive at the shop, place the train inside to melt, and head out to get rest.

In 2014 Goderich-Exeter ran about 20 plow extras, while Ontario Southland operated eight. In 2015 each railway ran about a half-dozen plow extras. Before that, plow extras were rare on the two railroads. Between 2008 and 2013 you can count on one hand the number of plow extras that ran on both roads. Whether the plows come out in the winter of 2016 depends on the severity of the winter season. Whatever happens, the crews and the plows of these two railroads will be ready to roll when winter comes. **I**

STEPHEN C. HOST is a professional engineer, vice chairman of the Guelph Junction Railway, and president of the non-profit Guelph Historical Railway Association.

Snow day AT REZ

A rare snowfall in Tacoma, Wash., made for an interesting day for a Burlington Northern train order operator in the 1970s

by Jon D. Ruesch



When I moved in 1977 from my home state of Wisconsin to work on the Burlington Northern's Pacific Division, I didn't realize how little it snowed in the Pacific Northwest. But I found out one day in late 1977.

By then I was a new train order operator working at Reservation Tower, an armstrong plant located at the north end of Tacoma, Wash. "Rez," as it was often called, was a busy job with three Amtrak trains per day as well as several mainline freights to Portland every shift, and way too many locals running between Tacoma, Seattle, and Auburn. Add to that the interlocking plant action the need to copy train orders for all Portland-

bound trains, and it became an extremely busy job, especially early on second shift. Coupled to that were Union Pacific trains running either behind the tower on Milwaukee Road tracks to Seattle or on BN tracks through the plant, and this railfan operator barely had time to notice the wonderful power racing by on all the freights.

This was the era just before BN disposed of its wealth of Alco and EMD-cab unit power. Though the six-axle Centuries didn't often make it up to Seattle by this time, plenty of F units and four-axle Alcos did. Add to that the multitude of foreign power showing up on UP (especially Missouri Pa-

cific and Frisco), and every night you had all sorts of excitement awaiting you.

And never more so than when it snowed. I had invited fellow telegrapher (and later TRAINS associate editor) Paul D. Schneider along one night by describing (probably embellishing) all the cool power I was seeing on UP freights. So he agreed to come along.

We were initially delayed in Seattle when we noticed one of the Portland

A BN train, led by two GP9s, prepares to depart the Tacoma, Wash., yard during a rare snowfall on Jan. 9, 1980. Blair Kooistra





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IN MY OWN WORDS



The author waits for his friend to photograph two RS3s and two F units as they arrive in Seattle. Paul D. Schneider, Jon D. Ruesch collection

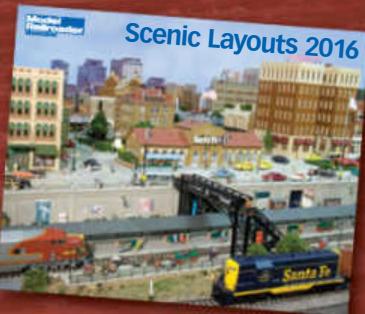
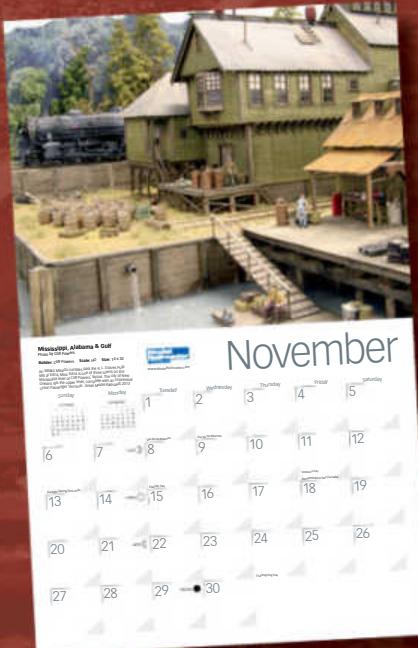


The author works inside BN Reservation Tower in Tacoma on a snowy night in 1977.

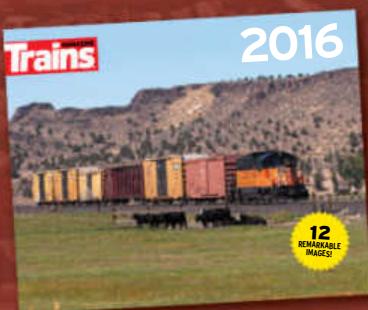
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freights coming into town with the unrepeatable combination of two F units and two RS3s. That slowed us down a bit leaving town, which only made the falling snow situation worse. Growing up in Wisconsin, I was used to huge, seemingly unending snowfalls, so the evening's smattering of snow showers didn't seem that bad. Sadly, it did cause the commuters on I-5 to slow to a crawl down the freeway as I cursed drivers who didn't know how to drive in snow.

Finally, we reached Rez, just as the second-trick operator, Carl, was leaving. He stopped opposite my car and informed me that nothing was coming and drove off. Once I got one of the locals safely in the yard, the situation was looking up. But it was still snowing and there must've been 3 inches on the ground by then.

I had been trained by Carl that in cold weather you should periodically throw the switches every now and then to make sure they didn't ice up. After all, this was the Pacific Northwest and they didn't have those highly useful switch heaters to melt the snow that I came to know and love when I worked later in the Chicago region. So I started exercising the switches. Remember these were all armstrong levers and some of the crossovers, like the one the UP used to run around their yard on BN tracks, took some effort to throw.

An hour into the shift, that UP cross-

over was getting impossible to throw. So I figured my best option was to let the dispatcher know of my troubles. He told me that I should call the Tacoma yardmaster to get the section crew out to sweep out the switches. The Tacoma yardmaster told me that was the dispatcher's job, and the situation quickly deteriorated to the point where they were having a heated conversation on the dispatcher's phone. Finally, one of them called the section crew out, and shortly, three burly guys with brooms and shovels showed up to clean out my switches. It seemed like overkill with only 3 or so inches of snow on the ground, but the switches seemed to be working well once they were cleared of snow.

But not for long. No. 798, the last Amtrak train of the day from Portland, showed up around 8:30 p.m., on time. Simple. No switches to throw, just a simple lock lever and the signal. Well, not so simple this day. For while the lock lever was normally easy enough for a healthy 8-year-old to manipulate, on this day, it was completely obstinate. No. 798 was now shouting over the radio for the signal.

"Schneider," I shouted, "help me throw this thing!" Schneider had already grown bored by now at the lack of interesting power on the UP and me cursing the snow, the BN, and everything in between, but he gamely came over to help me wrestle with the unmovable lock lever. And unmovable it remained, even though both of us were now throwing all our weight on it. No. 798's cries became more fervent. Finally, just as 798 was grinding to a halt, the lever moved. "Thanks," came over the radio as the signal finally cleared, and the Amtrak train moved steadily through the interlocking plant with no further problems. The rest of the shift passed without incident.

The next day, Carl told me that the section crew had to come out that morning because there was a solid block of ice built up on the UP crossover switches. I didn't say anything, just nodded. But silently I said a prayer that never again would I be forced to work Rez on a day when it snowed. And I never did.

JON D. RUESCH worked as an interlocking tower operator and dispatcher for Burlington Northern Railroad from 1977 until 1984, and for the Milwaukee Road briefly in 1984. He worked in non-railroad occupations until his retirement in 2012. He lives on the north side of Chicago with his wife Marcy and a small model railroad.



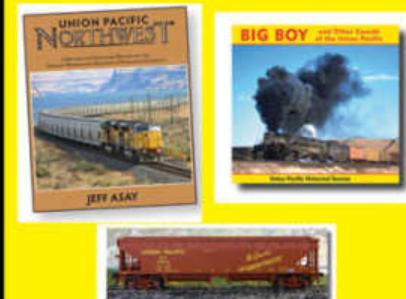
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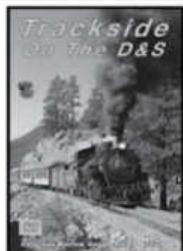
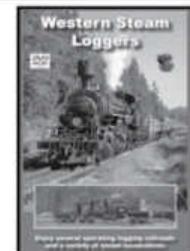
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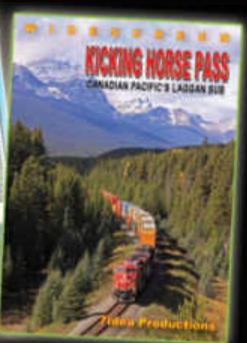
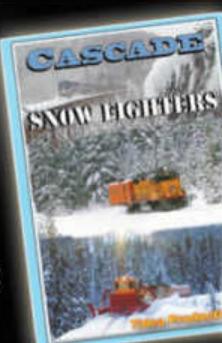
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NS steam 2015 – by the numbers

An engine-by-engine recap of the best steam season in years; a look ahead at 2016



Southern Railway 4501
1911 2-8-2
2,162 miles in 2015
Est. 200+ tons of coal used

Tennessee Valley Railroad Museum operated Southern Railway No. 4501 on Chattanooga-Cleveland, Tenn., excursions in September. Davidson Ward



Nickel Plate Road 765
1941 2-8-4
4,125 miles in 2015
471 tons of coal used

In addition to its extensive Northeastern tour, Nickel Plate Road No. 765 visited Ohio's Cuyahoga Valley Scenic Railroad in September, running off 370 miles on the tourist railroad. At right, N&W No. 611 rolls in Virginia. Above, Derek Day; right, TRAINS: Jim Wrinn

If you thought there was a lot of steam on the main line this year, you were right. The three locomotives entrusted to pull Norfolk Southern 21st Century Steam trips racked up more than 9,000 miles on more than 20 public excursions. Those figures also include trips Nickel Plate Road No. 765 pulled on Ohio's Cuyahoga Valley Scenic Railroad, in what is becoming an annual tradition for the Berkshire.

The mainline steam picture for 2016 may be bright again if NS authorizes more trips with Nos. 765, 611, and 4501.

Out West big steam is looking good, too. Southern Pacific 4-8-4 No. 4449's overhaul is almost finished and continues to enjoy the support of host BNSF Railway in the Portland, Ore., area. Stablemate Spokane, Portland & Seattle 4-8-4 No. 700 will be the subject of fundraising for its 1,472-day inspection. Also, Union Pacific is nearing completion of an overhaul on 4-8-4 No. 844 at its steam shop in Cheyenne, Wyo., before diving in on a long-term project, Big Boy No. 4014.

The nonprofit working to overhaul Reading Co. 4-8-4 No. 2100 in Cleveland completed an initial inspection of the Northern.

Anyone want to venture a guess that when 2016 is done, mainline steam mileage will top 10,000?



Norfolk & Western 611
1950 4-8-4
2,395 miles in 2015
210 tons of coal used

» PRESERVATION BRIEFS

NS SD40 and GP60 make special run in Ohio



Norfolk Southern SD40 No. 3170 made a guest appearance on a **Cincinnati Railway** excursion between Lima and Quincy, Ohio, sponsored by the Allen County Historical Society on Sept. 20, 2015. The trip ran push-pull with NS GP60 No. 7139 on the other end. The train traveled over former **Detroit, Toledo & Ironton** rails that are now operated by the **Indiana & Ohio Railway**. In this view, the train is crossing the massive trestle just north of Quincy. Erik Landrum



Wabash-painted F7s Nos. 1950 and 1951, formerly of Missouri's **Columbia Star Dinner Train**, pull a cut of storage cars at Trego, Wis., in September after **Wisconsin Great Northern** shortline and tourist railroad acquired the set. The two former **Great Northern** units had pulled the **Grand Traverse Dinner Train** at Traverse City, Mich., before moving to Missouri, where they ran 2011-2014. The trainset includes a former **Chicago, Burlington & Quincy** full-length kitchen car and two articulated two-unit coach sets of **Southern Pacific** heritage. Wisconsin Great Northern already owned other F units. Steve Smedley



Former **Conrail E33 electric No. 4601** was on the move in September. The unit had been in storage in Connecticut since 2003 and is moving to **Illinois Railway Museum** after cosmetic work. The engine is one of 12 built for the **Virginian**, then sold to **New Haven** before joining Conrail. The only other one is on display at the **Virginia Museum of Transportation** in Roanoke. James Kerr

The **Association of Tourist Railroads & Railway Museums** spring meeting will be April 14-16 at the **Colorado Railroad Museum** in Golden. The annual fall conference will be at the **Georgia State Railroad Museum** in Savannah, Ga., Nov. 8-12, 2016. Both meetings include seminars, networking events, and tours. Details: www.attrm.org.

Former **Denver & Rio Grande Western** 4-6-0 No. 168 moved from 77 years of display in Colorado Springs, Colo., to the **Cumbres & Toltec Scenic Railroad** in September. The 1883 Baldwin is on a 45-year lease and will be restored as the oldest operating locomotive on the historic railroad across 10,000-foot Cumbres Pass.

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An NS 21st Century Steam excursion adds to the mileage totals for riders at Williamstown, Ky., in May 2014. Four photos, Robert S. McGonigal

Making your rail mileage count

Mileage collection can add a new dimension to the railfan hobby

Railroads are all about places — where the rails go to transport freight and passengers. In the 1920s, the “Index of Railroad Stations” at the back of each edition of *The Official Guide of the Railways* — the 3-inch-thick monthly directory of all North American railroads and their services — would run to more than 260 pages of agate type that listed more than 84,000 railroad stations. At that time, the U.S. rail network was just past its peak of about 254,000 miles, with many thousands of passenger trains operating every day.

Today's rail system is much smaller, about 140,000 miles, and Amtrak's national timetable is one-tenth the size of the old Guide. But, there are still plenty of trains to ride, and for those of us who believe that the best way to see a railroad is to travel over it, those trains hold vast potential for enjoyment and learning.

I began riding trains on my own in the mid-1970s around my hometown of Philadelphia. After a while it occurred to me that, in addition to the notes I took on each trip, a good way to record my journeys

would be to highlight the lines I'd ridden in my 1973 edition of the Rand McNally “Handy Railroad Atlas of the United States.” It was satisfying to relive the trips as my red marker followed the lines in the atlas. Those few highlighted lines stood in contrast to the many that weren't, and my main motivation for riding new lines — to see the territory — was joined by a desire to ink in other lines. Without knowing that such an activity had a name, and before others who engaged in it had coalesced into the community they enjoy today, I had begun “collecting mileage.”

True, I'm not in the same league as the 100 or so truly avid North American mileage collectors. (For an insight into the hardcore mileage collector's mind-set, see “The Rules of the Game,” April 1991.) But the desire to explore new rail routes is widespread among those who like to ride trains.

Mileage is most readily collected, of course, by riding scheduled passenger trains whose main function is to provide transportation. Amtrak's network spans some 21,000 miles; VIA Rail Canada's sys-

tem encompasses another 7,800 or so. (Mexico has lost essentially all of its regular rail passenger service.) About two dozen commuter operations are found in metropolitan areas across the U.S. and Canada.

Tourist railroads run on regular schedules as well (though generally not daily or year-round), offering trips ranging from a couple of miles to 60 or more.

Most of the rail network does not host regular passenger service. Mileage collectors consider such freight-only lines as “rare mileage,” and sometimes go to great lengths to ride them. Public excursions announced weeks or months in advance, such as those operated as part of Norfolk Southern's 21st Century Steam program, are the most accessible way to rack up rare mileage, although most riders are not aboard for that reason. Smaller operators like High Iron Travel cater to more dedicated mileage collectors, often running multi-day trips at, of necessity, prices that tend to discourage casual riders.

Occasionally, severe weather, derailments, or track maintenance result in regu-



The westbound Empire Builder detours through Milwaukee on Union Pacific rails in June 2008 on account of flooding on the regular Canadian Pacific route near Reesville, Wis.

lar passenger trains being detoured off their normal routes, sometimes on short notice. In such cases the mileage-collecting communication network springs to action.

Perhaps the rarest way to get rare mileage these days is to ride with the crew of a freight train. Official permission for such rides is hard to secure, and concerns about security and safety have largely relegated the informal "Come on up" invitation from a crew member to the past.

A mileage collector's highlighted atlas really represents the *routes* he or she has collected. Some people maintain a tally of the miles they have ridden, even repeated trips over "old mileage." In this respect, the most famous mileage collector of all was the late Rogers E. M. Whitaker, who wrote about train travel for *The New Yorker* under the name "E. M. Frimbo" [see "How to be an Inveterate Train Rider," July 1966]. His claim of 2,748,636.81 lifetime, worldwide miles is regarded as unbeatable, although the precision im-

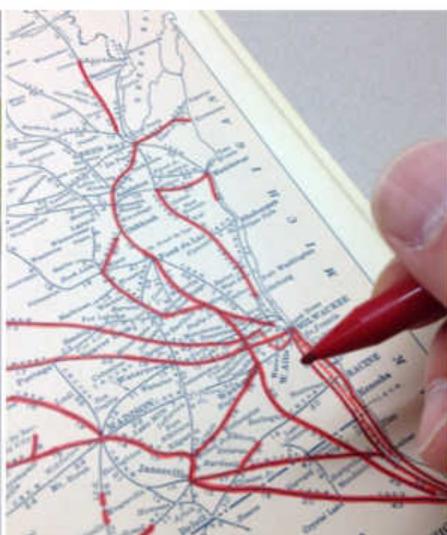
plied by the ".81" makes one wonder if he wasn't putting us all on a bit.

I don't know how many total miles I've ridden, although I could get a pretty good approximation of my unduplicated mileage from my old Rand McNally. But I prefer reviewing my red-line trophies, and looking at all those lines waiting to be ridden.

ROBERT S. McGONIGAL has been editor of *CLASSIC TRAINS* since its launch in 2000.

Mileage ground rules

- Only steel-wheel-on-steel-rail mileage counts — no bike trails
- All railroads are allowable, including light rail and amusement parks
- Any method of propulsion counts
- Day or night, miles can be collected
- The collector can categorize miles in any way that he or she sees fit



The author's 1973 atlas shows the lines he's ridden in four decades of mileage collecting.

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On June 8, 2015, Montana Rail Link's business train soars high over the white waters of Fish Creek, near Rivulet, Mont. During this trip, the railroad's owner, Dennis Washington, hosted business partners aboard the train. Steven Welch

Q What is the purpose of railroad business and inspection trains, and who would use them? — Dennis B. Miller, Redwood City, Calif.

A The Class I railroads, and some smaller operations, maintain special passenger-car fleets for official business. That can vary from entertaining important clients and public officials and inspecting the physical plant of the railroad to hosting emergency first responders to familiarize them with the rail industry. The term "inspection train" can range from an executive-level look at the right-of-way to a two-car setup with specialized equipment to detect flaws in rails and ties, also commonly known as a "geometry train." One abbreviation, "OCS" for "office car special," is used in railfan discussions when talking about such moves. One common "OCS" move occurs each spring when railroads move their business cars to Louisville to entertain guests during the Kentucky Derby. Other events that regularly attract railroad business trains are political conventions, major sporting events, and charity runs. Some railroads, in conjunction with Operation Lifesaver, will bring emergency first responders aboard business trains to help in teaching railroad oper-

ations and public safety, and even allow them in the cab to provide an engineer's view of grade-crossing dangers. Much of the equipment in the railroads' office car fleets largely dates to the postwar era of streamliners. The Class I railroads even obtained a number of railfan-favorite dome cars for business use after they were

phased out of the Amtrak intercity car fleet. Other cars include sleepers, diners, and lounges with space for meetings and windows for observing the right-of-way. Many railroads operate so-called "theater cars" with elevated seating for viewing out the back of the train.

— Brian Schmidt



A two-car CSX Transportation track inspection, or "geometry," train scours the former Baltimore & Ohio main line at Defiance, Ohio, in January 2011. Brian Schmidt

>> This Month:

- Railroad business trains
- Tracking train lengths
- Diesel-hydraulic locomotives

Q If an engineer has a train with 100 or more cars and he gets a signal to take the siding, how does he know when he and all the cars have cleared the switch?
— Richard Hampton, Homestead, Fla.



Controls for measuring the length of a train (circled) are integrated into the touch screen Video Information Display on an EMD SD70ACe. TRAINS: Tom Danneman

A Railroaders employ a device known as a "distance counter" to measure feet covered by the train to determine if it has cleared a switch or speed restriction, for example. Nearly every mainline locomotive operating today has a distance counter. The devices tend to take on two common forms, although many variations are in use. On modern computer-controlled locomotives, the distance counter is a button on the engineer's display that will count the feet of track covered from the time it is activated. They will generally count up from zero, down from a preset length, or do both. The ones that will do both, count up or down, are shown as a choice the engineer makes when setting the locomotive up for that trip. Some loco-

motives will only count down from a preset length. For example, when a train has to clear the main line at Waukesha, Wis., the location of a short passing siding, on a northbound train, the engineer starts the distance counter just past the signal on the siding that governs the south end of the siding. That is the "clearance point" that the train needs to be past to enable the opposing train to pass safely. When the distance counter shows the train is in the clear, the engineer stops the train and awaits the meet. On older locomotives without computer controls, an analog distance counter is located in the end-of-train receiver box in the cab that also shows brake pipe pressure on the train's rear end. — Ray Weart, locomotive engineer

Q What can you tell me about the Krauss-Maffei diesel-hydraulic locomotives that operated in the U.S. in the 1960s? Which railroads purchased and operated them, and what became of them?
— Rod W. Gower, Adelaide, Australia

A Two North American railroads purchased the 3,540-hp Krauss Maffei model ML4000 diesel-hydraulic locomotive in two varieties: Denver & Rio Grande Western and Southern Pacific. Rio Grande and SP both purchased three cab-style unit models while the latter also opted for 15 hood unit models. Rio Grande eventually sold its units to the Southern Pacific, which retired the entire fleet by the end of 1968. While the units did not last long in revenue service, they did nudge the domestic locomotive builders to develop higher horsepower models. One unit, No. 9010, survived and was converted into a special camera-equipment car to record video for the SP's locomotive simulator. It was later donated to the California State Railroad Museum, and then acquired by the Pacific Locomotive Association in Niles, Calif., where it is now undergoing restoration for operation. — Brian Schmidt

In the latest issue

Winter 2015 Edition



Hudson Valley Hot Spot

Oscawana, N.Y., on the New York Central's Hudson Division was a great place to savor 4-6-4s, Niagaras, and early diesels in 1952

B&O's Western Outpost

The branch between Springfield and Beardstown, Ill., was an unlikely extremity of a great eastern trunk line

Rails in the Sunrise

Canada's Cape Breton Island, one of the easternmost points in North America, hosted Sydney & Louisbourg steam operations until 1961

Before the J

Overshadowed by the superb class J 4-8-4s, Norfolk & Western's class K 4-8-2s were solid and long-lived

Diesel Demonstrators

Dave Ingles looks back on encounters with GE, EMD, and Alco sales ambassadors during the 1960s

Herding the Goats

In the waning days of SP steam, a young fireman with visions of mainline glory often had to settle for duty on lowly yard engines

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Krauss-Maffei diesel-hydraulic No. 9120 pulls an excursion for the Pacific Locomotive Association out of Oakland, Calif., in April 1967. The same organization would later work to restore sister unit No. 9010 to operation. Robert L. Hogan

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DECEMBER 12, 2015: 58th Buckeye Model Trains & Railroad Artifacts Show. Ohio Expo Center (Lausche Bldg.), 717 East 17th Ave., Columbus, Ohio, 9:00am-4:00pm. Early admission available Friday PM (11th). Over 300 tables of model trains and railroad artifacts for sale. Miller, 3106 N. Rochester St., Arlington, VA 22213, 703-536-2954. E-mail: rshs@ao.com or www.gserr.com

DECEMBER 19-20, 2015: 14th Tampa Model Train Show & Sale, Florida State Fairgrounds (Special Events Center), Tampa, Florida. Saturday 9:00am-5:00pm and Sunday 10:00am-4:00pm. Over 300 tables, thousands of railroad items for sale. Early admission available Friday PM. (December 18th). Parking fee. LSSAE: Miller, 3106 N. Rochester St., Arlington, VA 22213, 703-536-2954. E-mail: rshs@ao.com or www.gserr.com

DECEMBER 12-13, 2015: Rocky Mountain Train Show, Denver Mart, 451 East 58th Avenue, Denver, CO. Saturday 10:00am-5:00pm; Sunday 10:00am-4:00pm. Admission \$9.00, under 12 free. All Scales Show, 600 Tables, 30 Layouts, Parking \$5.00. Sponsored by Rocky Mountain Division-TCA. Information John Gardberg 303-364-0274. Discount coupon www.RockyMountainTrainShow.com

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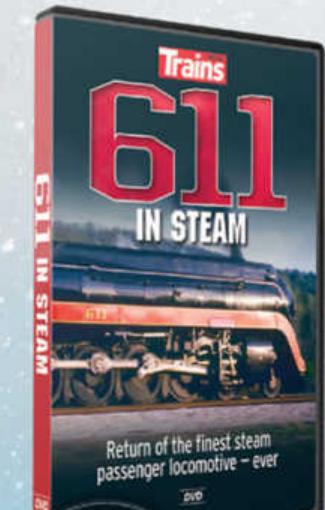
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A5CT

Gallery

Christmas thunder

Union Pacific 2-10-2 No. 5060 smokes up a winter sky as it moves freight east toward Omaha at Elkhorn, Neb. On Christmas Day 1951, the sun is low in the sky, a reflection of the ebbing steam season on UP in the 1950s.

— Photo by Thomas O. Dutch





Indiana snow

Snow may cause problems on roads, but it poses none to two northbound Indiana Rail Road Geeps crossing Lost Creek Trestle on the former Milwaukee Road in Terre Haute, Ind., on March 1, 2015. The train started at Hiawatha Yard in Jasonville, Ind. — Photo by Don Nickel



End of the line

Illinois Central 2-4-6T No. 1431 pauses at a coal bunker at the end of the branch off the Iowa Division to Addison, Ill., on June 12, 1931.
— Photo by A.W. Johnson



Dealey Plaza today

The infamous Texas School Book Depository near tracks leading to Dallas Union Station has been overlooked as a train-watching site. However, an elevator tower that brings visitors to the Sixth Floor Museum provides an excellent view of rail activity. On July 8, 2013, an eastbound Union Pacific freight pauses as it crosses the Trinity River before heading through the station, while two light rail trains meet in the foreground.

— Photo by Gordon Glattenberg





Dusk at Duke

On a late September 2014 morning, Norfolk Southern freight train 17D with a visiting BNSF ES44DC on the lead departs Spencer Yard southern Davidson County, N.C. The train, bound for Macon, Ga., is passing control point Duke, named for a nearby Duke Energy power plant. Immediately ahead, the Yadkin River. — *Photo by Clint Renegar*

Sparks for a cause

Volunteer Wayne Laepple grinds inside the smokebox of Wiscasset, Waterville & Farmington No. 9, an 0-4-4T built in 1891. The locomotive, which received a new boiler, is nearing completion on this Maine preservation railway. No. 9 is the oldest surviving Maine 2-foot-gauge locomotive. — *Photo by Stephen Hussar*





Old, but still reliable

The 1910 brick roundhouse at Paris, Ky., once belonged to Louisville & Nashville, whose nickname was "the old reliable." Today, Transkentucky Transportation Railroad still uses the structure to service 11 General Electric B36-7 diesels, like these three lined up for photographers on Aug. 8, 2014. The coal hauler works Kentucky coal between Paris and Maysville, where it is loaded onto Ohio River barges. — Photo by Steve Smedley



Not what they seem

Johnson Railway Services provides two repowered former Alcos to CMC Steel in Cayce, S.C. The red S2 typically sees the most use while the RS1 is backup power. — Photo by Joseph C. Hinson

Color before cold

Canadian National train No. 148 rolls through the brilliant fall colors of the Niagara Escarpment in the Webster's Falls Conservation Area on Oct. 23, 2014. The location is at Dundas, Ontario. Dundas peak, where this view was made, is accessible by a walking trail. — Photo by Stephen C. Host





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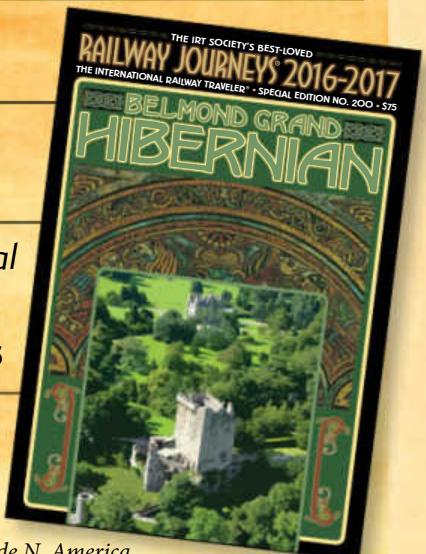
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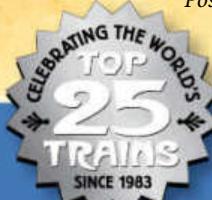


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